Communicating Climate Change:

A Qualitative Discourse Analysis of the 2007 Nobel Peace Prize Lectures by Al Gore and Rajendra K. Pachauri

By

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Abbreviations and explanations

App.	Appendix
Ex.	Examples
(G1)/ (P1)	The example/ ex. (1) is from Gore/ Pachauri
(G, 2)/ (P, 2)	Excerpt is from Gore/ Pachauri, **paragraph** 2
G-text	The Nobel Lecture given by The Nobel Peace Prize Laureate 2007, Al Gore © THE NOBEL FOUNDATION 2007.
MA	Modal Auxiliary
Macmillan	Macmillan Dictionary. available from URL: http://www.macmillandictionary.com/
MED	*Macmillan English Dictionary for advanced learners*, 2007, 2nd edition (complete reference in bibliography).
P-text	The Nobel Lecture given by The Nobel Peace Prize Laureate 2007, Intergovernmental Panel on Climate Change (IPCC), represented by R K Pachauri, Chairman © THE NOBEL FOUNDATION 2007.

1: Introduction

On December 10, 2007 Albert Arnold Gore and Rajendra Kumar Pachauri, Chairman of, and representative of, the Intergovernmental Panel of Climate Change, were officially awarded the Nobel Peace Prize of 2007. At the award ceremony, the Laureates receive the Nobel Diploma and the Nobel Medal, and then give their Nobel Lectures to the audience in the Oslo City Hall, and to the people watching the ceremony on television or online (nobelpeazeprize.org 1).[1]

The topic of their lectures caught my attention. I have for a long time been interested in environmental issues and the impacts that humans make on their surroundings. Gore and the IPCC work in different ways to make people aware of what the climate changes are, how they might affect us, how they can be limited, and what we can do to reduce the damage. The increasingly certain fact that the climate changes are a result of anthropogenic activities, should be a wake-up call for everybody, and perhaps most for the people in the western world, who actually have the resources to make a difference. The possible consequences some predict for the future are impacts we should strive to avoid. Therefore, I was personally delighted to hear that Gore and the IPCC won the Peace Prize in 2007. When it comes to media attention, this was an excellent opportunity for the cause of climate change, and public awareness probably reached its highest point in years. Indeed, Michael Oppenheimer, a participant in the IPCC, said that it "is now engaged at the highest level it will probably be" (Revkin October 13, 2007).

1.1 Aim and scope

The primary objective of this study is to analyse how two speakers communicate their message(s) in light of their communicative goals.[2] An interrelated secondary objective is how the two speakers communicate the complex issue of climate change. To address these aims, this study will use a combination of theoretical approaches to consider modality, evidence, fear appeals, and metaphors in the lectures.

[1] Hereafter I will refer to Rajendra Kumar Pachauri as Pachauri; I will refer to Albert Arnold Gore as Al Gore or Gore; I will refer to the Intergovernmental Panel of Climate Change as the IPCC; I will refer to the Nobel Peace Prize of 2007 as the Peace Prize or the NPP.

[2] I use the terms 'hearer' and 'speaker' like Halliday (1994).

This paper will show how the two speakers have adopted different communicative strategies to reach their goals, and how because of this, there will be areas in which the texts will differ, e.g. in terms of communicative style; technical terminology; hedging; expressed modal responsibility; explicit personal commitment; type of evidence, and additional sources.[3] Through analytical approaches that focus on speaker involvement, commitment, and interpersonal communicative strategies, it is possible to identify and explain some of the differences between the two texts. In addition, I will address the context of situation, and contextual restrictions that apply for the speakers. Based on the analyses in chapters 4 and 5, this paper will also present some tentative explanations regarding what may affect the understanding of the two texts.

1.2 Comments on the data

Due to copyrights, it was not possible to include both lectures in full text in an Appendix. Permission to include excerpts from the lectures was granted from the Nobel Foundation. Therefore, I have only included excerpts in the Appendix, in addition to the examples in chapters 1-5 (see App. 1). The lectures in full text are available from the official website for The Norwegian Nobel Institute (Gore, © THE NOBEL FOUNDATION 2007 ; Pachauri, © THE NOBEL FOUNDATION 2007, URLs in bibliography).

For the analyses, the texts were archived as Word documents (.doc), and paragraphs were numbered for easy reference. The texts differ in length and organization; Pachauri's lecture contains 3656 words, separated into 33 paragraphs, and Gore's lecture contains 2878 words, separated into 59 paragraphs. The word count does not discriminate between the speakers' own words and the quotes they have included.

The laureates do not receive any information regarding what should go in their Nobel Lectures. The information they receive is limited to instructions on the length of the text. However, they do receive copies of previous lectures (Kühle-Gotovac, September 23, 2008), and previous lectures are available from the official website for the Nobel Foundation (nobelprize.org 1).

[3] 'Strategy' here is used as a less conscious decision than what is normally considered when talking about strategies. A person's communicative strategy may evolve over a stretch of time, and may not necessarily reflect a conscious choice.

1.3 Theoretical foundation

The theoretical framework, which comprises the foundation for the analyses of modality and hypothetical meaning, draws on Halliday (1994), Thompson (2004), Quirk, Greenbaum, Leech and Svartvik (1985), Palmer (1990), and Coates (1983). This framework is outlined in chapter 2 below. The theoretical framework for the presentation of, and the discussion of, evidence and fear appeals in chapter 5, draws on Perloff (2003) and Witte, Meyer, & Martell (2001). The theory of metaphor in this paper draws on works by Lakoff and Johnson (1980), Lule (2004), Charteris-Black (2006), and Lakoff (2008). A further introduction of the terminology and theory applied in these analyses are given in chapters 2 and 5.

1.4 Methodology

1.4.1 Analysis of modality

The modality analysis was performed first, and the focus was to find out how the Laureates negotiate information. The search function in Microsoft Office Word 2003, in combination with manual searches, was used to identify and locate modal auxiliaries, marginal auxiliaries, and content disjuncts expressing modality (see chapters 2 and 4). Quirk et al. (1985: 1086-1087) provide the framework for recognizing and locating hypothetical meaning expressed by other means than through a modal auxiliary or a modal idiom (cf. sections 2.4.3 and 2.4.4). Having identified modal expressions and expressions of hypothetical meaning, I grouped the expressions in lists. For example, all expressions of the modal meaning of 'possibility' in each text were grouped together. This gave an account of the different ways of expressing possibility and the frequency with which this meaning occurred in each text. This provided an opportunity for comparison between the texts.

One disadvantage was the resulting contextual disorder. However, the texts were read repeatedly before, during and after the analyses were completed, since contextual consideration is necessary to classify modal and hypothetical meanings. In addition, the texts, in their original form, were available for contextual reference.

1.4.1.1 Notes on the analysis of modality and hypothetical meaning

This study has adopted a broad interpretation of potential modality expressing elements in a clause (see section 1.4.1). Halliday provides the functional framework and Quirk et al. (1985) provide the grammatical vocabulary and the framework for a grammatical categorization of

the modal expressions, in particular a categorization of the verbs that have the potential for expressing modality. This is outlined in chapter 2.

This study also opens up for a broad consideration of the boundaries for the categories of modal meaning. In chapter 2, attempts are made, to the best of the researcher's ability, to explain and illustrate why some of the examples from the data are categorized as having more than one possible meaning, by pointing to objective, contextual facts. Some readers may disagree with the choices made in this paper, and argue that it is necessary, and possible, to make a clear distinction between the various modal meanings, also the ones occurring in this analysis. Considering the fact that modality is a complex area (cf. e.g. Coates, 1983; Quirk, 1985; Palmer, 1990; Halliday, 1994, Davies 2001), it makes sense to attempt to clarify as precisely as possible the various modal meanings, so as not to contribute to an increased confusion and 'fuzziness'. Attempts at this have been made in this paper, and the analysis of modal expressions has been carried out in empirical fashion; based on what is actually there in the texts, and considered in their context. Analysing modal meaning is necessarily based on some subjective understanding of what is going on in the text, so a note is hereby made about the risk of bias caused by limitations in the analyst.

1.4.2 Message factors

The second part of the analysis considers message factors in the texts – evidence, fear appeals, and metaphors. This sheds light on what the speaker wants to emphasize, and is a means to understand persuasive strategies.

The message factors (sections 5.2, 5.3, and 5.5) were retrieved mostly through manual search. Noticing fear appeals and metaphors relies on a recognition of potential fear-inducing messages and metaphorical language and the analyst's interpretation (see further section 1.4.2.1). The evidence is recognized by the quotation marks that signal its presence. The quotes were grouped according to the framework provided in Perloff (2003), and were further divided into evidence and fear appeals.

1.4.2.1 Analysing metaphors

The metaphors were grouped into overarching conceptual metaphors (Lakoff and Johnson 1980; Lule 2004; Charteris-Black 2006; Lakoff 2008). Charteris-Black presents a three-step method for analysing metaphors where the metaphors are identified, interpreted, and explained (2006: 26-29). After identifying and counting the metaphors (step 1), they are

grouped together under source domains (step 2), and the most frequent domains provide the basis for the discussion (step 3). I have adopted this same procedure, as will be shown in chapter 5.

Semino (2008) stresses the fact that words or phrases, in certain contexts, convey metaphoric potential. However, it is not necessarily the case that a writer intentionally produced a metaphor, or that the hearer perceives a word or phrase as a metaphor (see further section 5.5). The experience of metaphors is necessarily subjective and this is inevitable, because "it is not possible to predict entirely emotional responses to language" (Charteris-Black 2006: 29).

The potentially metaphoric language in the data was identified mainly by considering (cf. Lule 2004):

Actors: We are standing at the most fateful fork in that path. (G, 55)

Settings: The very web of life on which we depend is being ripped and frayed. (G, 15)

Actions: We, the human species, are confronting a planetary emergency (G, 8)

A dictionary was used to help establish the metaphoric potential of the words and phrases in section 5.5.1 (MED 2007; Macmillan; 2007(cf. abbreviations above)). By considering the basic meaning of the word and comparing this meaning to the contextual meaning in which it occurs, it is possible to make tentative conclusions regarding the metaphoric potential of a particular word or phrase (Pragglejaz 2007: 3). It is also possible to reduce the degree to which metaphor analysis depends on subjective interpretation alone.

1.4.2.2. Analogy

In addition to metaphors, this paper will also consider a few occurrences of another rhetorical feature. *Analogies* – or appeals to history which invite a comparison between two situations "illustrate our thoughts, opinions, and ideologies, which, through this continuity, appear less random and arbitrary, and more like objective facts" (Bhatia 2007: 515). Bhatia (2007) studied several speeches by George W. Bush and Osama bin Laden, and found that Bush used analogies in attempts to create support in the war on terror. Appeal to time is a persuasive tool, in that it clearly emphasises the persistent nature of "terrorism – and how important it is to take action against that evil" (2007: 515). This study will show that similar attempts are made by Gore in his speech.

1.5 Context of situation

It is necessary to; at least briefly, consider the context in which the texts occur. The context of situation can be understood and considered in terms of three different parts of a situation type (Halliday 2002). They are the field, tenor, and mode 'of discourse', which are realized in the ideational, interpersonal, and textual metafunction respectively (see further section 2.1).

1.5.1 The field of discourse

The occasion is the 2007 Nobel Peace Prize Ceremony. The award is shared between Al Gore and the IPCC, "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change" (Mjøs 2007). Chairman Mjøs also emphasised the connection between climate change, resource scarcity, and the increasing potential for conflicts within and between countries because of this, to further explain why the IPCC and Al Gore were awarded the NPP. Consequently, the texts are included in the larger area of discourse on climate change, which is a highly complex (cf. Sterman and Sweeney 2007; Maibach, Roser-Renouf, and Leiserowitz 2008) and politicised field (cf. Weingart, Engels and Pansegrau 2000).

The content of the texts differs between the two speakers. In Gore's text, the content can be summarized as "a series of warnings of a growing threat – 'a planetary emergency' –; warnings about the already visible effects resulting from this approaching threat; a number of steps and suggestions necessary to limit the damage; and a request for action".

In Pachauri's text, the content can be summarized as "a presentation of scientific assessments of predicted climate change, the consequences of human activities in relation to these changes and concerns regarding the impacts of climate changes".

1.5.2 The tenor of discourse

The participants involved are the Laureates and the audiences.

1.5.2.1 The Laureates

Characteristic of lectures is that the 'animator' (the 'sound box'), 'author' (the one who formulates and scripts the statements that are made), and 'principal' (someone who believes in what is being said and takes the position that is implied in the remarks) are the same person (Goffman 1981: 167). This 'functionary' is assumed to hold more knowledge and experience

in textual matters than the audience, and has monopoly on the floor for as long as the lecture lasts (ibid). The speakers can be viewed as 'performers', who present themselves before an audience to provide a performance (Goffman 1981: 165).

The Laureates are from different backgrounds; Pachauri has devoted his professional career to science (ipcc.ch 1), Gore to politics, and later environmental issues. As Chairman of the IPCC, Pachauri represents a panel of scientist. Gore represents himself, and his views on the climate changes. Pachauri's lecture results in a lengthy and warm applause. Gore's lecture gives him a standing ovation. So, why does one speaker generate so much more enthusiasm? One answer is that Al Gore has devoted a majority of his life to politics, which has helped hone his rhetorical skills, and eloquence. Another point to consider is whom they represent, and the restraints this places on the speaker.

1.5.2.2 Background information on the IPCC

The mandate of the IPCC gives the following description of the Panel's objectives, role, and restrictions:

> 1. The IPCC was established to provide the decision-makers and others interested in climate change with **an objective source of information about climate change**. The IPCC does not conduct any research nor does it monitor climate related data or parameters. Its role is to **assess** on a comprehensive, objective, open and transparent basis the **latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts and options for adaptation and mitigation**. IPCC reports should be **neutral with respect to policy**, although they need to **deal objectively with policy relevant scientific, technical and socio economic factors**. They should be of **high scientific and technical standards**, and aim to **reflect a range of views, expertise and wide geographical coverage** (ipcc.ch 2.).[4]

As Chairman of the IPCC, Pachauri represents this organisation. These qualities which make the IPCC a trusted source of information, will affect the communicative goal of the speaker, and the extent to which he will allow himself to express personal commitment, appeal to the audience, and demand action.

1.5.2.3 The audience

The recipients of a lecture are an 'immediate audience' (Goffman 1981: 165). By this use of immediate audience, Goffman means:

> *a gathered set of individuals, typically seated, whose numbers can vary greatly without requiring the speaker (typically standing) to change his style, who have the right to hold the whole of the speaker's body in the focus of staring-at attention (as they would an entertainer),*

[4] In all the examples throughout this paper, emphasis (***climate***) is added, unless otherwise stated.

> *and who (initially, at least) have only the back channel through which to convey their response* (Goffman 1981: 165).

The audience of this event was a complex composite of people. On the one hand, there were the people present in the Oslo City Hall, members of the Royal Family, representatives of the Government, the Storting, the Corps Diplomatique, and other specially invited guests (nobelpeaceprize.org). On the other hand, the event was also broadcast on TV and online, to reach a wider audience. This was a public lecture, with no close contact, and no interaction between speaker and audience, and the floor was not open for audience comments/ questions.

Determining who constitutes the broadcast audience is difficult, if not impossible, and not relevant to this paper. However, for anyone giving a lecture, it is relevant to at least briefly consider the potential target group(s), or create a target recipient. This may, or may not influence the communicative style of the speaker.

In this paper, the focus is not so much on the speaker/hearer relationship, as on the speaker's expression of his message/s. How the message/s is/are perceived by the audience is not within the scope of this study. However, assuming that not every member of the audience holds the same amount of scientific knowledge as Pachauri is a qualified guess, and this is likely to influence audience perception of his lecture. This text, as will be seen, is by far the more 'technical' of the two.

1.5.3 The mode of discourse

One aspect of mode concerns the channel used. In this context, the channel of communication is 'written to be spoken and intended to be heard' (Hillier 2004: 3). The speaker is the animator, or "the thing that sound comes out of" (Goffman 1981: 167). This suggests that the two texts contain elements from both written and spoken genres. They are planned and prepared in advance as written texts, but they are delivered on one occasion for a particular purpose. However, they are available as written texts, so an analyst does not have to transcribe the data.

The other aspect of mode concerns the text's rhetorical function (Halliday 2002); that is, is it a persuasive, expository, or didactic text. In this respect, the two texts go different ways. Gore explicitly states his communicative goal:

2. Even though I fear my words cannot match this moment, **I pray what I am feeling in my heart will be communicated clearly enough that those who hear me will say, "We must act."** (G, 6)

Pachauri does not explicitly state his goal; but it can be inferred from the following extract:

3. The power and promise of collective scientific endeavour, which, as demonstrated by the IPCC, can reach across national boundaries and political differences in the pursuit of objectives defining the larger good of human society.
   The importance of the role of knowledge in shaping public policy and guiding global affairs for the sustainable development of human society.
   An acknowledgement of the threats to stability and human security inherent in the impacts of a changing climate and, therefore, the need for developing an effective rationale for timely and adequate action to avoid such threats in the future.

4. **These three realities encircle an important truth that must guide global action involving the entire human race in the future**. (P, 4-5).

From these extracts, it is clear that the two speakers share a communicative goal, which can be summarized as; *rational, sufficient, and urgent global collaboration is necessary to meet the challenges of climate change*. This study is thus concerned with some of the manners in which the speakers communicate the issue of climate change.

1.6 Ethos, pathos and logos

'Ethos' reflects the character, and conveys the values and behaviour of the speaker (Charteris-Black 2006). The speaker's personality and stance is reflected in her/his presentation. The latter concerns the adopted viewpoint of the speaker and his tone towards a topic (Cockcroft and Cockcroft 1992).

In chapter 4 I will show that Gore uses inclusive *we* on several occasions in his text. This reflects a broad viewpoint as the speaker talks on behalf of a large number of people.

Metaphors can be employed as a form of self-evaluation of the speaker, while evaluating the policies or propositions the speaker expresses (cf. Charteris-Black 2006). This means that the potential metaphors present the message in a certain light (as will be shown in section 5.5.1), and this again reflects the image of the speaker.

Gore presents the climate changes as potential disaster:

5. **The very web of life** on which we depend **is being ripped and frayed**.

This implies that of all the possible metaphors Gore could have chosen, he opted for one that focuses on destruction.

'Pathos' is the hearer response, the hearer's emotional engagement (Cockcroft and Cockcroft 1992). Included here are emotional appeals founded on sources of feelings accessible to all the communicative participants. Example (5) illustrates one manner in which fear may be evoked in the audience. Gore presents an image of a delicate spider web being ripped as analogous to our future existence.

'Logos' is the content of a given speech (Charteris-Black 2006). Logos structures emotion and reasoning. It includes the arguments, the structure of thought, the sequence, coherence, and logical value (Cockcroft and Cockcroft 1992). In SFL terms, this corresponds to the ideational metafunction (Halliday 1994).

The interpersonal metafunction is associated with both ethos and pathos. In chapter 4, the relationship between the interpersonal metafunction and ethos and pathos will be considered on the clause level, through the analysis of modality. In chapter 5, this relationship will be considered through the analysis of evidence, fear appeals, and potential metaphors. These message factors contribute to emphasise the role of language as an interactional exchange between speaker and hearer.

1.7 The lecture as a genre

A lecture is "an institutionalized holding of the floor in which one speaker imparts his view on a subject, these thoughts comprising what can be called his "'text'" (Goffman 1981: 165). Furthermore, Goffman mentions that lecture 'talk' is "typically serious and slightly impersonal, the controlling intent being to generate calmly considered understanding, not mere entertainment, emotional impact, or immediate action" (ibid). A type of lecture is a 'one-shot' lecture delivered on a 'celebrative occasion', which is a "social affair that is looked forward to and back upon as a festivity of some kind whose business at hand (…) is not the only reason for participation" (Goffman 1981: 168). The focal point, rather than to inform, is to honour and celebrate something. Goffman notes that such celebrative occasions appear to be an important organizational form of our public life.

The particular occasion on which the two texts were given corresponds to what Goffman refers to as a 'celebrative occasion'. It is an honourable occasion for the speakers, and an important chance for them to communicate what they think is important for the public to know about their work. Here the speakers are given the opportunity to emphasise what they want, to focus on their preferred aspect of a particular topic, and to express this in the

communicative style of their choice. They are also free to include additional sources (see further section 5.4). As mentioned in section 1.5.2 there is a difference in what restrictions apply to the speakers (see further chapter 4).

1.8. Ideology

Ideologies are conveyed by linguistic expressions of implicit common-sense assumptions that people normally do not recognise (Fairclough 2001: 2). They are embedded in language and are difficult to recognise as they are mostly taken for granted as common sense. Since they are easy to miss, they are a key function to gaining consent, as ideology "is most effective when its workings are least visible" (Fairclough 2001: 71). Seeing that language is the most used tool for expressing ideology it is a natural starting point for analysing such common-sense assumptions. Ideology is considered only briefly, as this study will not focus extensively or in detail on the speakers' ideology. Yet, it is difficult to get past it completely, as the data do convey the speakers' points of view and thereby sometimes suggest instances of such common-sense assumptions, or presupposed knowledge.

1.9 Study outline

Chapter 1 presents the background to, and the objective of, this study. It also presents the data and methodology and some concepts.

Chapter 2 gives an account of the theoretical background for the analysis of modality and hypothetical meaning to be presented in chapter 4. This chapter presents the framework for the analysis, and discusses some difficulties encountered in the analysis, concerning the classification of modal meanings. The interpersonal metafunction considers the clause as an exchange between speaker and hearer.

Chapter 3 introduces two studies which state that language can contribute to make climate change difficult to understand. At the same time, the studies suggest that increased understanding can be achieved by means of language. These studies provide an underlying focus for the ensuing discussions in chapters 4 and 5.

Chapter 4 presents the analysis of modality and hypothetical meaning.

Chapter 5 discusses the message factors. The focus turns from the clause to the sentence and the message, and the intention is to consider language as an exchange between speaker and hearer.

Chapter 6 concludes this study, and presents some suggestions for further research.

2: The Interpersonal Metafunction; Mood, Modality and Hypothetical Meaning

2.1 The theory of Systemic Functional Linguistics (SFL)

M. A. K. Halliday is the cornerstone in the field of SFL, and thorough work has been made, and a solid foundation has been built, within the area of SFL. For a full presentation of the framework that SFL presents see for instance Halliday (1994), Martin and Rose (2003) Halliday and Matthiessen (2004) and Geoff Thompson (2004).

SFL is concerned with how words, word groups, and clauses are structured to form meaning and create larger pieces of text. It considers language use, and is not too rigidly focused on grammar, but rather how grammar can be used to achieve different communicative goals. SFL considers grammar as a system of choices available to us as language users. This suggests that we have options for how to express our opinions, advice and complaints etc., and SFL provides a way to consider the choices made, and the options that were not chosen. Halliday (1994) presents three kinds of meaning carried by clauses, clause complexes, and sentences. They are the experiential, interpersonal, and textual meaning of the clause. These metafunctions all have their own systems of choices, which make up the structure of each component. Thus, when we want to perform a text analysis within the model of SFL, each of these three components presents a framework for an analysis (Thompson 2004):

- The 'experiential metafunction' is concerned with how entities and events are referred to in the clause.
- The 'interpersonal metafunction' is concerned with the relationship between speaker and hearer, and how meaning is negotiated.
- The 'textual metafunction' is concerned with how the speaker organizes the clause and structures small or larger pieces of texts.

In addition to these three, there is also the 'logical metafunction', which relates to how we choose to combine clauses and connect messages. This metafunction is not included in the discussion about meaning within the clause, because "it is not embodied in the clause but in

the clause complex" (Halliday 1994: 36). This paper will not give a detailed presentation of all the metafunctions.[5]

SFL provides a variety of ways to analyse texts. Selecting one way and excluding others, as in this paper, means that there will be interesting characteristics of the texts that will not be included in the discussion. These topics are, of course, not less important or interesting, but the scope of this paper is necessarily restricted by limited time and space. This paper operates within the framework of the interpersonal meaning of language.

2.2 The clause as exchange: The interpersonal metafunction

Within SFL, the clause is viewed as a message and an interactive event between speaker and hearer. Geoff Thompson (2004) mentions that the interpersonal meaning of a clause is not "inherently tied to specific constituents", rather it can be spread across the whole clause, and it "may well be cumulative, reinforced by being expressed at several points in the clause" (2004: 66). In other words, modal meaning can be spread across a clause and can be expressed through different textual constituents. This is an important feature of the SFL theory; it considers the entire clause as a meaning expressing unit. The implication for this paper is that when I consider modality, I will consider a wider context, not merely individual finite modal auxiliaries (see further section 2.3.4).

2.2.1 The Mood

Hallidayan grammar views language as a system of choices, and within the interpersonal metafunction 'the mood system' (or Mood) is what constitutes this system of choices. The Mood consists of a Subject and a Finite, which restricts grammatical variation in a proposition to the Mood element (Halliday 1994).[6] In other words, the Mood shows grammatical variation through the Subject and the Finite (see further sections 2.2.1.1 and 2.2.1.2). Within the Mood, the indicative is the grammatical category characteristically used to exchange information, and it requires a Subject and a Finite (S+F). Modal Adjuncts are also located in the mood (see

[5] For a full presentation of the textual metafunction, cf. Halliday (1994: 37-67); on the interpersonal metafunction (ibid: 68-105), on the experiential metafunction, (ibid: 106-175); and on the logical metafunction (ibid: 215-291).
[6] Halliday uses 'function labels' to signal a functional element, such as Subject and Actor (cf. 1994: 29).

section 2.3.2). The remainder of the clause is called 'the Residue' (Halliday 1994: 74).[7] This paper will not elaborate on the elements in the Residue any further.

To illustrate the presentation of the Mood, below is an example of a clause analysis on the interpersonal level:

I	have	a purpose here today (G, 2)
S	F	
Mood		Residue

I + *have* constitute the Mood element, and *a purpose here today* is the Residue. The S^F-order in the Mood shows that this sentence is a declarative. The non-modalized Finite (*have*) expresses positive polarity and present tense. A past tense finite (*had*) or a present tense finite with negative polarity (*haven't*) would have presented a different message to the audience. As would a modal operator (such as *may* or *could*) The Subject (*I*) in this case Al Gore, is the one being held responsible for the clause.

As the example shows, the Mood expresses whether a clause is a declarative (usually S^F sequence, *I have a purpose here today*), an imperative (*State your purpose!*) or an interrogative, and also what kind of interrogative (F^S, yes/no interrogative, *Do you have a purpose here today?* or S^F, wh-interrogative, *Who has a purpose here today?*). Declaratives, interrogatives, and imperatives comprise the choices in the Mood system of the English language (Thompson 2004: 36).

Usually, imperatives have the function of prompting some kind of action or command, and they are distinguished from declaratives and interrogatives in that they do not require a Subject and a Finite (Thompson 2004: 37). Questions, and information eliciting, are usually expressed by interrogative clauses (Thompson 2004: 47), and declaratives are the most common way to express statements, and thus to pass on information (see further section 2.2.2).

The Mood is the core of the exchange at the interpersonal level, whereas "the rest of the clause merely fills in the details" (Thompson 2004: 54). Perhaps not surprisingly, declaratives constitute the absolute majority of the clauses in both of the two texts. There were very few

[7] The Residue consists of a Predicator (the non-finite element in the verbal group), a Complement (an attribute, and an element which has the potential of being Subject but is not) and circumstantial Adjuncts (related to the experiential meaning) (Halliday 1994: 78-81).

interrogatives and imperatives in the texts, ex. (1) and ex. (2) present some of those that do occur:

(1) Interrogative: (F^S/ yes/no-interrogative, here expressing a rhetorical question)
Will those responsible for decisions in the field of climate change at the global level listen to the voice of science and knowledge, which is now loud and clear? (P, 33)

(2) Imperative:
Let us acknowledge that if we wish to redeem squandered time and speak again with moral authority, then these are the hard truths: (G, 51)

2.2.1.1 Subject

In 'propositions' – when language is used to exchange information – the Subject contributes with "something by reference to which the proposition can be affirmed or denied" (Halliday 1994: 76).[8] Thus, propositions can be "affirmed or denied, and also doubted, contradicted, insisted on, accepted with reservation, qualified, tempered, regretted and so on" (ibid: 70).

The Subject can appear as any nominal group, and in a declarative, it is the element that is picked up by the pronoun in a tag question (Halliday 1994: 72-73). Within Hallidayan grammar, the Subject is a functional concept, which means that in propositions (statements and questions) the Subject specifies the responsible element:

(3) **The IPCC** produces key scientific material that is of the highest relevance to policymaking, and is agreed word-by-word by all governments, … (P, 3)

The Subject (in bold) specifies "the one on which the validity of the information is made to rest" (Halliday 1994: 76) and the underlined Finite verb specifies positive polarity and present tense.

The characteristics of propositions allow the recipients to respond in agreement or disagreement, and the Subject is the entity that is made responsible for whatever proposition being proposed, and its validity. Consequently, if the hearers would have any reservations towards the statement in ex. (3), and had the opportunity to answer, they could have contradicted the proposition by saying; *no, it doesn't*, or; *I don't agree that it does* (where *it* substitutes the Subject of the original proposition). By modifying the Finite the hearer can "accept, reject, query or qualify the validity (…), but the Subject must remain the same" (Thompson 2004: 53). This, however, becomes more difficult for the hearer when the

[8] The term 'Subject' as used by Halliday (1994) "corresponds to the 'grammatical Subject' of earlier terminology; but it is being reinterpreted here in functional terms. The label 'grammatical Subject' seems to imply a grammatical function whose only function is to be a grammatical function; whereas the element in question is *semantic* in origin, like all other elements of the clause" (72, emphasis added). This way of using the Subject opens up the possibility for including other less usual elements in the Subject 'role' (cf. Halliday, 1994: 73).

responsible part is not so obvious, or cannot be considered to be responsible. Furthermore, the choice of pronouns reflects the degrees of distance between speaker and hearer (cf. Cockroft and Cockroft 1992:27) (this will be discussed in chapter 4).

In 'proposals' – when language is used to exchange goods-&-services – the Subject specifies the one actually responsible for realizing the offer or command (Halliday 1994: 76). The Subject is usually the speaker in an offer, and the hearer in a command (Halliday 1994: 76).

2.2.1.2 Finite

The Finite makes the proposition finite, and it is the other main element in the Mood. A finite proposition can be argued about, and it "relates the proposition to its context in the speech event" (Halliday 1994: 75). The Finite can express (ibid: 76):

- Tense – by reference to the time – past, present or future – of speaking, relative to speaker's 'now'. Thompson (2004) adds; "for the present time and actual situation or for other times – past, future – or for unreal situations":

(4) This difficult process <u>is</u> made possible by the tremendous strength of (...) (P, 3)

- Modality – by reference to the judgement of the speaker; of the probabilities, or the *obligation*s involved in what the speaker is saying:

(5) It <u>would</u> be particularly relevant to conduct in-depth analysis of risks to security among the most vulnerable sectors and communities impacted by climate change across the globe. (P, 7)

- Polarity – by showing positive or negative validity

(6) But they will <u>not</u> take us far enough without collective action. (G, 35)

Of the features expressed by the Finite, modality is of particular interest in this paper. This is because one facet of the present work is concerned with the Nobel Laureates' attitudes towards their propositions, and particularly their statements.

2.2.2 The function of the Mood

The Mood is part of the clause and its meaning as an exchange. The metafunctional meaning of the Mood is interpersonal. It expresses the "interactional meaning: what the clause is doing, as a verbal exchange between speaker – writer and audience" (Halliday 1994: 179). What Halliday (1994) is referring to when he talks about the clause as an exchange, is that a speaker can adopt certain roles in the act of speaking. Halliday mentions two types of fundamental 'speech roles': the roles of giving and demanding. In adopting one of these roles, the speaker

automatically assigns a complementary role to the hearer; if the speaker adopts the role of giver of information (for example) then the hearer is automatically assigned the role of (cf. ex. (5) above). If the speaker adopts the role of demander, the hearer is assigned the role of giver or doer (such as here: *Conduct in-depth analysis of risks to security!*). An act of speaking may thus be described as an 'interact', "it is an exchange, in which giving implies receiving and demanding implies giving in response" (Halliday 1994: 68). Information and goods-&-services constitute the two basic types of commodity exchange (see table 2.1).

The speech roles and the commodity exchanges comprise the four fundamental speech functions of 'offer', 'command', 'statement' and 'question', and each of these have expected responses attached to them, as shown in table 2.1.

Table 2.1: The speech functions and responses (adaptation of table 4(1) in Halliday 1994: 69)

	Initiation	Expected response	Discretionary alternative
Give goods-&-services	offer	acceptance	rejection
Demand goods-&-services	command	undertaking	refusal
Give information	statement	acknowledgment	contradiction
Demand information	question	answer	disclaimer

Statements and questions are used to give and demand information, whereas offers and commands are used to give and demand goods-&-services. Offers are not associated with a specific mood choice, as languages, generally, "do not develop special resources for offers and commands" (Halliday 1994: 70). Halliday says that with offers and commands, "language is functioning simply as a means towards achieving what are essentially non-linguistic ends" (1994: 70). Consequently, propositions and proposals differ in that propositions have a clearly defined grammar whereas proposals do not.

Considering the speech functions and the speech roles, and the commodity exchange they constitute, provides a framework for understanding how Gore and Pachauri structure their messages. That is, do the speakers give information, or do they demand goods-&-services? The discussion in chapter 4 will consider this point further.

The remainder of the chapter considers modality and outlines the methodology that provides the framework for the discussion in chapter 4. Sections 2.3.2 and 2.3.3 give a more elaborate presentation of modality as presented in Halliday (1994), and in Quirk et al. (1985). Section 2.3.4 provides a summary of the theoretical outline, in a presentation of the broad framework of modality adopted in this study. Section 2.3.5 presents modal metaphors, and discusses how modality can express speaker responsibility. Section 2.4 presents hypothetical meaning and

manners in which this is expressed in the two texts. Section 2.5 discusses certain problematic matters concerning modal and hypothetical meanings. Section 2.6 presents a summary of the framework for the modality analyses discussed in chapter 4, and section 2.7 concludes the chapter.

2.3 Modal meanings and expressions of modality

A theory of modality is a theory of how the speaker negotiates meaning, expresses tentativeness, uncertainty, beliefs etc. Modality is "the speaker's judgement of the probabilities, or the *obligation*s involved in what he is saying" (Halliday 1994: 75). Halliday also describes modality as the collective term for the intermediate degrees that fall between positive or negative polarity. In other words, between the choice of positive *is*/ *do* and negative *isn't*/ *don't* there is a space where modality works.

According to Halliday (1994), we turn to different means in order to express what we want. If we are uncertain as to whether what we are saying is the case, we find ways to express this uncertainty, and if we want someone to do us a favour, we find ways to express this as well. Depending on factors such as context, occasion, and audience, but also personality, academic background (or lack of such) and mood, we choose our words and use them to present our views, wishes, demands, doubts, certainties and so on (cf. field, tenor, and mode in section 1.5*ff*).

Quirk et al. (1985) suggest that "at its most general, *modality* may be defined as the manner in which the meaning of a clause is qualified so as to reflect the speaker's judgement of the likelihood of the proposition it expresses being true" (1985: 219).

Like Halliday, Martin and Rose (2003) suggest that the cline between positive and negative meaning "opens up a space for negotiation, in which different points of view can circulate around an issue" (ibid: 50), and in which modality operates. They relate these degrees of polarity to how obliged you are to do something (*do it, you must do it, you should do it, you could do it, don't do it*), or how probable a statement is (*it is, it must be, it should be, it might be, it isn't*) (cf. 'modal responsibility' in section 2.3.5.1). The former type, expressing obligation and inclination is referred to as modulation (Halliday 1994: 89), and the latter, expressing degrees of probability and usuality, is known as modalization within SFL (ibid.).

2.3.1 Values of modality

Modality involves degrees and scales, which indicates that in a proposition a speaker can signal a lower or higher degree of certainty about its validity (*may*/*will*) and, in giving a command, the speaker can signal a higher/lower degree of pressure on the other person to carry it out (*must*/*should*) (Thompson 2004: 69). Choice of modal degree reflects the speaker's commitment; "the degree to which the speaker commits herself to the validity of what she is saying" (ibid.). In academic papers, the author must consider whether he should advance a claim as definite or as still open to doubt. Whereas when issuing advice, the speaker needs to decide to what degree s/he should be putting pressure on the recipient (ibid.). Halliday (1994) outlines three values of modality, which are high, median, and low.

Table 2.2: Values of modality (Adaptation of table 10 (3) in Halliday 1994: 358)

	Probability	*Usuality*	*Obligation*	*Inclination*
High	certain	always	required	determined
Median	probable	usually	supposed	Keen
Low	possible	sometimes	allowed	willing

Halliday (1994) states that even a high value modal is less determinate than a polar form, since "you only say you are certain when you are not" (89).

Next follows the bipartite presentation of modality. The focus in sections 2.3.2 and 2.3.3 is on how modality can be expressed in a clause and what the modal meaning expresses, depending on whether the utterance is a statement or a question; an offer or a command.

2.3.2 The system of modality in SFL

Modality is viewed as a category of meaning in SFL. It can be expressed in the following ways (Halliday 1994: 89-91):

- **by means of a finite modal operator**

(7) In a question (F^S):

> Have we the will to act vigorously and in time, or will we remain imprisoned by a dangerous illusion? (G, 30)

(8) In a statement (S^F):

> We must abandon the conceit that individual, isolated, private actions are the answer. (G, 35)

The finite modal operators are presented in table 2.3. Section 2.3.4 below will see a more elaborate classification of these modal operators.

Table 2.3: Categorization of modal operators (adaptation of table 4(3), in Halliday 1994: 76)

Modal operators:			
	low	median	high
positive	can, may, could, might, (dare)	will, would, should, is/was to	must, ought to, need, has/had to
negative	needn't, doesn't/didn't + need to, have to	won't, wouldn't, shouldn't, (isn't/ wasn't to)	mustn't, oughtn't to, can't, couldn't, (mayn't, mightn't, hasn't/hadn't to)

- **by means of a modal adjunct of probability or usuality**

(9) In a statement (S^F):

> We have everything we need to get started, save perhaps political will, but political will is a renewable resource. (G, 58)

Modal adjuncts express the speakers' "judgement regarding the relevance of the message" (Halliday 1994: 49), and there are three groups of adjuncts (ibid: 82):

1. Adjuncts of polarity and modality (expressing polarity, probability, usuality, readiness and obligation)
2. Adjuncts of temporality (expressing time and typicality)
3. Adjuncts of mood (expressing obviousness, intensity and degree)

The adjuncts of modality in group 1 are included in the present modality analysis, which is presented in chapter 4. Example (9) above demonstrates *perhaps* used to express probability.

The last two devices for expressing modality in Halliday's terms are:

- **by means of a finite modal operator *and* a modal adjunct:** *It must always happen*
- **by means of an expansion of the Predicator:** This is typically a passive verb: *You're required to be patient!* or an adjective: *I'm determined to win!*.

The first of these last two devices occurs in propositions only, and the last only in proposals (Halliday, 1994: 91, table 4(5)). There were no occurrences of these two categories in the two texts. However, there were other examples that resemble this last category, but they were not proposals in form:

(10) We never intended to cause all this destruction, just as Alfred Nobel never intended that dynamite be used for waging war. (G, 16)

The category 'an expansion of the Predicator' anticipates the presentation of modal metaphors below (see section 2.3.5). The possibility of a modal metaphor is available when modality is *not* expressed by means of a finite, but elsewhere in the clause; that is, by means of a noun, an adjective, a modal adjunct, or a predicate. This means that everything that is not a finite modal operator (or MA), but *does* express modality, is considered a modal metaphor. In

addition, a modal metaphor may occur if the modal expression, which can also be an MA, is presented as framing the proposition (examples are given in the discussion in section 2.3.5 below). The category called semi-auxiliaries in Quirk et al. (1985) (section 2.3.3.2 below) correspond at least partly to what Halliday (1994: 354-363) describes as modal metaphors.

As well as expressing modality through different clausal elements, modality works in different ways depending on whether the utterance is a proposition or a proposal. Modality within the theory of SFL works on the scales of usuality, probability, obligation, inclination, and ability/potentiality.

2.3.2.1 Modalization in propositions

A positive proposition is asserting (*it is so*), whereas a negative proposition is refuting (*it isn't so*) (Halliday 1994). In propositions, modality expresses degrees of probability and usuality (Halliday 1994: 89):

- **Degrees of probability**: possibly, probably, certainly.

  This is equivalent to *either yes or no*, or *maybe yes, maybe no*, which express different degrees of likelihood – how likely it is to be true.

- **Degrees of usuality**: sometimes, usually, always.

  This is equivalent to *both yes and no*, or *sometimes yes, sometimes no*, which express different degrees of 'oftenness' – how frequently it is true.

2.3.2.2 Modulation in proposals

The modal meaning in offers and commands are prescribing (*do it*) when the proposal is positive, and proscribing (*don't do it*) when the proposal is negative (Halliday 1994: 89).
In proposals, the modal meaning differs depending on the speech function:

- In commands they are **degrees of obligation**: 'allowed to/ supposed to/ required to'
- In offers they are **degrees of inclination**: 'willing to/ anxious to/ determined to'

2.3.3 Means of expressing modality in reference grammars – Quirk et al.

Quirk et al.'s reference grammar (1985) allows space for a fuller discussion of the verb categories than does Halliday (1994). This categorization is particularly relevant for this paper and the analyses of modality in the two Nobel lectures, and that is why this section provides a relatively lengthy presentation of these verb categories. Predominantly the terms are adopted

from Quirk et al., along with their classification of modal meaning as **intrinsic** and **extrinsic** modality.

The modal meanings expressed by the modal auxiliaries (MAs) are divided into intrinsic and extrinsic meaning (Quirk et al. 1985: 219-220):

- **Intrinsic meaning**: expresses permission, obligation, and volition – this involves some kind of intrinsic human control over events.
- **Extrinsic meaning**: expresses possibility, necessity, and prediction – this typically involves human judgement of what is or what is not likely to happen.

Ability is considered as a special case of possibility (Quirk et al. 1985: 221, note [a]), thus, ability is categorized as an extrinsic meaning. Ability is by Halliday considered as modulation (cf. section 2.3.2.2 above).

Intrinsic meaning corresponds to 'deontic modality', in which case the speaker gives permission or lays obligations (Palmer 1990: 10) (cf. Halliday's modulation). Extrinsic meaning is also referred to as 'epistemic modality', and Palmer suggest that epistemic modality is when the speaker makes "a judgment about the truth of the proposition" (ibid: 10) (cf. Halliday's modalization, and section 2.3.2.1 above).

There exists a gradient between intrinsic and extrinsic meaning, and the MAs are considered in groups of similar or overlapping meanings (Quirk et al. 1985: 219-220). This illustrates the overlapping meaning potential of modal expressions. Also Halliday notes the overlapping potential of modal meanings, seeing that he presents modality as degrees of probability, usuality etc., and that the values of modality are considered in terms of degrees from low to high. I will return to this issue in section 2.5 below (fuzzy boundaries).

Next follows a brief presentation of the various verb categories introduced in Quirk et al. (1985). Afterwards, sections 2.3.3.1 and 2.3.3.2 offer a presentation of the verb categories appearing in the current material. These presentations focus on the verbs that convey a modal meaning; section 2.4 elaborates on the strategies for expressing hypothetical meaning.

Quirk et al. present the different categories of modal expressions on a scale from auxiliary verbs to main verbs, and the categories are (1985: 137, figure 3.40a):

- Central modals (*can*, *could*, *may*, *might*, *shall*, *should* etc.)

- Marginal modals (*dare*, *need ought to*, *used to*)
- Modal idioms (*had better*, *would rather/sooner*, BE *to* etc, HAVE *got to* etc.)
- Semi-auxiliaries (HAVE *to*, BE *supposed to*, BE *able to*, BE *going to*, etc.)
- Catenatives (SEEM *to*, HAPPEN *to*, SEEM *to*, GET + *ed* participle, etc.)
- Main verb + non-finite clause (HOPE + *to*-infinitive, BEGIN + *-ing* participle, etc.)

2.3.3.1 Modal auxiliaries (MA)

As mentioned, Quirk et al. (1985) divide the meaning of modal verbs into intrinsic meaning and extrinsic meaning. In addition, each modal has both an extrinsic use and an intrinsic use. Table 2.4 lists the central modals, which are presented as modal auxiliaries (MA) in Quirk et al. (1985), and their corresponding extrinsic and intrinsic meaning:

Table 2.4: The modal auxiliaries as presented by Quirk et al. (1985: 221*ff*).

Central Modals	Extrinsic modality				Intrinsic modality		
	Possibility	**Ability**	**Necessity**	**Prediction**	**Permission**	***Obligation***	**Volition**
Can	x	x			x		
Could	x	x			x		
May	x	x			x		
Might	x	x			x		
Shall				X			x
Should			x			x	
Will				X			x
Would				X			x
Must			x			x	

Of the MAs listed in table 2.4, *shall* is the only auxiliary that does not occur in either of the texts.

The following criteria are given as a way of recognizing modal auxiliaries, and they present the reason for why some auxiliaries, like *dare* and *need*, fall outside this category (Quirk et al. 1985: 137 table 3.40b).

- MAs are all followed by the bare infinitive (*these changes would have serious effects…*)
- MAs do not have nonfinite forms, and can only occur as the first (finite) element of the verb phrase (to **can*, (is) **canning*, (is) **canned*)
- MAs are not inflected in present tense or in the 3rd person singular (*she has to come/ she needs to come/ she *cans* (*to*) *come*)

- Both the present and past forms of the MAs can express present tense (*I can go tomorrow*/*could go tomorrow*).

The third point explains why *dare* and *need* are categorized as marginal modals, and not as central modals (Quirk et al. 1985). Some of the MAs are considered further in section 2.4.1.

2.3.3.2 Marginal auxiliaries

This section focuses on the multi-word verb category of marginal auxiliaries and some text examples are presented to illustrate why this category has been included in the current modality analysis. This is where the present study deviates from other studies of modality, which have confined their focus to a consideration of modal auxiliaries (cf. Davies 2001; Stenbakken 2007). Quirk et al. (1985) suggest that the marginal auxiliaries can express the same meaning as the MAs (possibility, necessity, permission etc.) (see Quirk et al. 1985: 236, table 4.66).

(A) Marginal modals

The marginal modals resemble the central modals in meaning. Example (11) illustrates a marginal modal:

(11) And most important of all, we need to put a price on carbon… (G, 47)

In ex. (11), *need* functions as a main verb, rather than as an auxiliary. The plural form of the subject *we* and the nonfinite form of the verb *need to* indicates this. The semantic meaning of *need*, on the other hand, resembles the modal meaning of obligation, and that is why this paper has decided to include such examples in the analysis of modality. This decision is supported by the variety of ways in which modality can be expressed (cf. the above presentations).

(B) Modal idioms

Of the multi-word verbs Quirk et al. present as modal idioms (such as *had better*, *would rather*, and BE to, cf. 1985: 137, 141), only BE *to* occurs in the present data.

All the modal idioms have meanings which are related to modality (such as advisability, volitional, obligation and logical necessity), and BE *to* expresses future sense, with connotations such as ‘compulsion’, ‘plan’, ‘destiny’ and so on, depending on context (see Quirk et al. 1985: 142-3). Furthermore, *were to* expresses futurity with a standpoint in the

past, and when located in a conditional clause it expresses hypothetical future meaning, as in ex. (12) (see further section 2.4.3 below):

(12) Science tells us not only that the climate system is changing, but also that further warming and sea level rise is in store even if greenhouse gases were to be stabilized today. (P, 26)

(C) Semi-auxiliaries

Of the different semi-auxiliaries listed in Quirk et al. (such as HAVE *to*, *be likely to* and BE *obliged to*, see 1985: 137, 143-145), *have to* and BE *likely to* occur in the texts. In addition to these, there were occurrences of BE *expected to* and BE *projected to*, which I have included here. This is because they resemble the form of the other semi-auxiliaries, because they express modal meaning and because the "boundaries of this category are not clear" (Quirk et al. 1985: 143). This study claims that for the present analysis the classification at this level is not that significant. What matters more is the meaning the auxiliaries express.

The semi-auxiliary HAVE *to* can occur in modal constructions. It is similar to *must* in meaning, and can express obligation or logical necessity, as in ex. (13) (Quirk et al. 1985: 145):

(13) That is just another way of saying that we have to expand the boundaries of what is possible. (G, 53)

BE *likely* (*to*) expresses prediction in the P-text (see further table 4.7 for examples of the semi-auxiliaries that express prediction in the P-text):

(14) Climate change is likely to lead to some irreversible impacts on biodiversity (P, 12)

Also BE *expected* (*to*) and BE *projected* (*to*) express prediction in the texts:

(15) In this regard, climate change will have several implications, as numerous adverse impacts are expected for some populations in terms of: (P, 8)

In example (15), BE *expected to* expresses modal meaning where a MA cannot occur, at least not without paraphrasing the proposition:

> In this regard, climate change will have several implications, as we expect that/ findings suggest that numerous adverse impacts will happen for some populations in terms of:

This shows that *are expected to* is a modal metaphor; that is, a modal meaning is expressed, but not in the most congruent way (see section 2.3.5 below). Including the pronoun reveals a responsible actor, all of a sudden. This might explain why the semi-auxiliary was selected. This point is discussed further in section 4.3.3 below.

(D) Catenative verb constructions

Catenatives have meanings related to modality, but they are closer to main verbs than are semi-auxiliaries (Quirk et al. 1985: 146). Among the catenatives listed in Quirk et al. (137, 147), SEEM *to* and INTEND *to* occur in the two texts. In ex. (16), *intended to* expresses 'volition':

(16) We never intended to cause all this destruction, just as Alfred Nobel never intended that dynamite be used for waging war (G, 16)

This has been a brief presentation of the possible meaning potential of the categories as presented by Quirk et al. (1985). The presentation and discussion in chapter 4 provides a more detailed explanation of the various meanings attached to the relevant expression of modality and hypothetical meaning. Since the present study is a small-scale, qualitative study, and not a large corpus investigation, there are relatively few occurrences of each modal expression, but there is quite a good selection of different modal strategies applied in the two texts. Consequently, space is provided to allow for a more interesting discussion of how the two speakers have applied modality and hypothetical meaning in their speeches.

2.3.3.3 Content disjuncts

Content disjuncts corresponds to Halliday's (1994) modal adjuncts (section 2.3.2). Content disjuncts, or attitudinal disjuncts, are divided into two subclasses in Quirk et al. (1985: 615):

Type a)	making an observation as to degree of or conditions for truth of content (e.g.: *really*, *certainly*…)
Type b)	making an observation as to value judgement of content (e.g.: *understandably*, *wisely*)

It is the first group that is relevant for this paper. These disjuncts "present a comment on the truth value of what is said, expressing the extent to which, and the conditions under which, the speaker believes that what he is saying is true" (Quirk et al. 1985: 620). This group of content disjuncts also includes hypothetical clauses:

(17) The implications of these changes, if they were to occur would be grave and disastrous. (P, 20)

Hypothetical meaning is discussed in section 2.4. These hypothetical clauses are presented as implicit *if*- clauses below (see also tables 4.8 and 4.9 in sections 4.4.1 and 4.4.3 below).

Of the type a) content disjuncts presented by Quirk et al. (1985), there are only a handful that occur in the texts. A quick glance at tables 4.13 and 4.14 (sections 4.7.1 and 4.7.2) illustrates that the majority of these express usuality, which is the reason why the present analysis has included Halliday's category. In addition, one expresses probability (cf. ex. (9) above) and one expresses necessity (ex. (54) in section 4.5.6 below). Example (18) expresses usuality:

(18) Sometimes, without warning, the future knocks on our door with a precious and painful vision of what might be. (G, 3)

These type a) disjuncts are included in the Mood system. They contribute to the interpersonal metafunction of the clause, and they construct a "context for the clause" (Halliday 1994: 84). That means that they contribute to frame the content of what the speaker is saying, and this is why they are included in the current analysis.

2.3.4 A broad concept of modality

The above presentation of modality has illustrated that it can be expressed in a number of ways; it is not limited to the finite element in the mood. On the contrary, that is simply the more congruent way of expressing modality. This section will attempt to show how the presentations in 2.3.2 and 2.3.3**,** may form a compatible framework for this qualitative analysis of modality.

In section 2.3.2, Halliday's outline of modality shows that finite modal operators, modal adjuncts, and an expansion of the predicator can express modality, and I suggest that when modality is expressed by some other linguistic structure than a finite, this constitutes a modal metaphor (see further section 2.3.5). Section 2.3.3 introduced Quirk et al.'s (1985) terminology, which is adopted in this paper. Quirk et al.'s grammar provides a categorisation of verbs and suggests that modality has the potential for being expressed by these different verb categories.

Some semantic and structural implications are connected with the different ways in which modality can be expressed. The semantic implication is that meanings of aspect, tense and modality can all be expressed through every one of these verb constructions. The structural implication is that the central modals comprise only single-word auxiliary verbs, whereas the other end of the scale presents combinations of verb phrases (such as BE *expected to* and BE *likely to*). This opens up for the possibility of considering modality beyond the finite MA. An extension of this is that it provides a more complete consideration of the speaker's choice of

modality. It might also provide a larger perspective for understanding the interpersonal strategies the speakers use. So, although there can be only one finite MA per clause, this framework allows for the expression of modality at several places in a clause, not merely in the Finite position.

A further implication is that an additional modal meaning may be added, as in ex. (19), where *should* expresses possibility/probability, *will* expresses prediction and the marginal auxiliary *need to* expresses *obligation*:

(19) While India **is** also growing fast in importance, it should be absolutely clear that it is the two largest CO2 emitters - most of all, my own country - that will need to make the boldest moves, or stand accountable before history for their failure to act. (G, 49)

As the examples in 2.3.2 and 2.3.3 show, it can be fruitful to consider longer verb constructions and a wider context.

2.3.5 Modal metaphors

As indicated already, modality can be expressed through grammatical metaphors, and what Quirk et al. (1985) have categorised as marginal modals, Halliday (1994) and Thompson (2004) describe as grammatical metaphors.

A grammatical metaphor occurs through substitution of one grammatical class or structure by another (Halliday 1993). Consider ex. (20), and then consider the possible paraphrase (21):

(20) These changes, if they were to occur would have serious effects on the sustainability of several ecosystems and the services they provide to human society (P, 12)

(21) *These changes, if they were to occur would in a serious way affect how capable several ecosystems would be to continue to go on for a long time (…)*

Expressing a process by means of a noun is an example of grammatical metaphors that typically occur in scientific discourse (cf. Halliday 1993: 79-82). Ex. (20) illustrates this feature. Here, a process (*to sustain*) is turned into an affected Participant (*the sustainability*), through nominalization (cf. Halliday 1993). The necessary rephrasing, or unpacking of the metaphor, is quite considerable.

Halliday 1994 presents two types of grammatical metaphors: metaphors of mood (including modality) and metaphors of transitivity. In semantic functional terms, these correspond to interpersonal metaphors and ideational metaphors (1994: 343).

Since this paper is concerned with how modality is expressed – within the interpersonal metafunction – the present analysis is restricted to a consideration of the interpersonal metaphors expressing modality.

'Interpersonal metaphors' involve non-congruent ways of enacting interaction, and they can be identified by considering the expression of Mood meanings (Thompson 2004: 231). A congruent expression of modality is through the Finite, whereas metaphorical expressions are through nouns, adjectives, content disjuncts, and marginal auxiliaries. However, a meaning is not expressed *either* metaphorically or congruently. That is, there is a gradient from a congruent expression to a 'complete' metaphorical expression. In other words, the level of necessary unpacking to reach the congruent form varies.

To tie this with modality it is useful to consider modal responsibility by means of considering the speaker's position "towards the likelihood or necessity of the proposition" (Thompson 2004: 232).

2.3.5.1 Modal responsibility

Speaker responsibility for an expression of modality is expressed implicitly or explicitly, depending on the clause structure (Thompson 2004: 71):

- **Implicitly** when modality is expressed in the same clause as the main proposition, and the modality is directed at the main proposition:

(22) We must quickly mobilize our civilization with the urgency and resolve that has previously been seen only when nations mobilized for war. (G, 27)

- **Explicitly** when modality is expressed in a separate clause, and frames the proposition in the main clause:

(23) It would be relevant to recall the words of President Gayoom of the Maldives at the Forty Second Session of the UN General Assembly on the 19 October 1987: (P, 27)

Modality can be expressed more or less explicitly and implicitly, seeing that there is a cline between the explicit and the implicit points (Thompson 2004: 72). The modal expression can further be objective or subjective, in addition to conveying implicit or explicit modality (Thompson 2004: 70). A speaker may then show, or hide, the source of the conviction, as well as expressing something about the level of certainty or obligation etc. attached to the proposition:

Expressed objectively: It would be relevant to recall the words of President Gayoom

Expressed subjectively: I think it is relevant to recall the words of President Gayoom

Explicit subjective modality expresses a type of interpersonal metaphor with an 'experientialized' attitude (Thompson 2004: 232). That is, the subjectivity is encoded in a separate projecting clause which frames the proposition in the projected clause (Halliday 1994: 355).

Explicit objective modality is also a kind of interpersonal metaphor where the modal meaning is experientialized (Thompson 2004: 233), and thus frames the proposition in the projected clause. In instances of explicit objective modality, the information in the proposition is projected as a fact, and the evaluation the speaker presents through modality is treated as if it were a quality of the fact:

(24) While India is also growing fast in importance, it should be absolutely clear that it is the two largest CO2 emitters - most of all, my own country -- that will need to make the boldest moves, or stand accountable before history for their failure to act. (G, 49)

In ex. (24), the underlined text constitutes the projecting clause, which frames the following proposition in the *that*-clause and presents it as a non-disputable fact. The modality in ex. (24) constitutes a modal metaphor. In comparison, ex. (22) above is a congruent form of expressing modality, and does not constitute a modal metaphor.

The issue of modal metaphors and modal responsibility is interesting because "writers and speakers may resort to various methods of masking their responsibility and presenting their viewpoint in an apparently objective way" (Thompson 2004: 72). Modality is likely to express the speaker's personal view, since any choice of modality has a source (Thompson 2004: 73). Moreover, unless the modality is credited to some other source, it must stem from the speaker (see 'evidence' in section 5.2). This has one interesting implication, because also in a relatively scientific an impersonal presentation as the lecture given by Pachauri, we find expressions of modality that stems from the speaker. Therefore, considering modal metaphors generates an opportunity for observing expressed speaker responsibility.

2.4 Different ways of expressing hypothetical meaning

Hypothetical meaning proved to be a significant category in the present analysis (see table 4.1). This finding qualified for a further consideration of hypothetical meaning, and the relationship between hypothetical meaning and other types of modality. This last point is

discussed in section 2.5 below. The current section considers the different ways in which the two speakers express hypothetical meaning in their texts.

Four 'strategies' for expressing hypothetical meaning appeared in the data. They are; hypothetical meaning expressed by means of 1) modal auxiliaries; 2) the modal idiom *were to*; 3) *if*-clauses; and 4) implicit *if*-clauses. The last category was briefly introduced above as disjuncts (section 2.3.3.3). This study refers to them as 'implicit *if*-clauses', a decision which is elaborated on below.

2.4.1 Modal auxiliaries

Of the various MAs, *would*, *could*, *should* and *might*, *would* is most commonly used to express hypothetical meaning (Coates 1983). The MA *would* express hypothetical meaning in the main clause in ex. (25), in which *if* is implied:

(25) -For a CO2-equivalent concentration at stabilization of 445-490 ppm, CO2 emissions would need to peak during the period 2000-15 and decline thereafter. (P, 24)

The auxiliaries that may express hypothetical meaning when in their past forms, like *could*, *might* and *would*, have as innate qualities that they add a sense of tentativeness or politeness to an utterance, and this tentativeness or politeness is closely related to hypothetical meaning (Quirk et al. 1985: 233). The meaning of these modals can still refer to the present or future time. In ex. (25), *would* expresses hypothetical meaning and prediction (cf. section 2.5 below).

In the data, the MAs *would* and *could* are used most frequently to express hypothetical meaning (cf. tables 4.8 and 4.9 below). However, the context in which *would* and *could* occur implies an additional sense of the modal meanings prediction and possibility, respectively.

2.4.2 The modal idiom were to

The second manner in which hypothetical meaning is expressed in the two texts, is through the modal idiom BE *to* (*were to*). *Were to* "expresses rather greater doubt than the more usual type of unreal condition" (Palmer 1990: 177). Quirk et al.(1985) note that *were to*, followed by the infinitive for expressing hypothetical meaning, as in ex. (26) below, is occasionally used in formal contexts, and then with a tentative overtone (1985: 143). This modal idiom occurs in Pachauri's text only. Whenever it occurs, it is always in combination with a conditional clause, and located in the **protasis** (see further section 2.4.3):

(26) Science tells us not only that the climate system is changing, but also that further warming and sea level rise is in store even if greenhouse gases were to be stabilized today. (P, 26)

The current texts are presented on a formal occasion (cf. sections 1.5.1 and 1.7 above), so this may be the reason why the speaker has used this particular modal idiom to express hypothetical meaning. As tables 4.8 and 4.9 illustrates, this is not a frequent strategy in any of the texts, and Gore does not apply it at all.

2.4.3 If-*clauses*

This third strategy for expressing hypothetical meaning is used in both texts. In this case, *if* is always explicitly marked:

(27) These are the last few years of decision, but they can be the first years of a bright and hopeful future if we do what we must. (G, 51)

These types of clauses express some kind of hypothetical meaning. Palmer (1990) mentions that conditional clauses consist of an *if*-clause and a main clause, which are also labelled 'the protasis' and 'the apodosis', respectively (1990: 168). A conditional clause indicates that "the truth of the proposition in the protasis is dependent on the truth of the proposition in the apodosis" (ibid.), giving the semantic form 'if *p* then *q*'. Palmer also notes that some types of conditional clauses may be called 'predictive' or 'causal' because of the causal relationship between the clauses. Thus, in ex. (27), the protasis predicts the main clause (*they can be…hopeful future*), if the protasis is fulfilled.

2.4.4 Implicit if-*clauses*

The fourth and final group is, as already mentioned, referred to as 'implicit *if*-clause'. This title is not very precise, as this group includes clauses that are introduced by subordinators such as *when*, *where* and *once*, as well as other examples which are even more implicit (cf. ex. (28)). However, for the present paper this 'rest category' fulfils its purpose and provides a classification method for a certain expression of hypothetical meaning. That is why this category contains examples such as ex. (28) and ex. (29):

(28) By facing and removing the danger of the climate crisis, we have the opportunity to gain the moral authority and vision to vastly increase our own capacity to solve other crises that have been too long ignored. (G, 41)

The underlined clause implies the *if*-clause *if we face and remove the danger of the climate crisis, then….*

(29) In every land, the truth - once known - has the power to set us free. (G, 32)

The subordinator *once* implies the prepositional phrase *in circumstances where* (*the truth is known*) (cf. Quirk et al. 1985: 1086). In other words, it refers to an, for the moment, unreal or hypothetical situation in which the truth of the proposition is dependent on the truth of the condition (Palmer 1990).

This section has briefly summarized the four strategies for expressing hypothetical meaning in the data; the next section will consider the fuzzy boundaries of modal meanings.

2.5 Fuzzy boundaries

What is suggested in this section is that the meanings of the categories in the tables (cf. table 2.4 above) are not always as clear-cut and distinct as the tables illustrate; there is a potential overlap between these categories. Modality expresses degrees of meaning, and this modal meaning can be negotiated in a space between '*yes* and *no*' (cf. Halliday 1994). This indicates that the boundaries between the categories of meaning may not always be so clear. Quite the opposite, modality is a fuzzy area in which it is not always easy to pin down a precise meaning of a certain expression of modality. The overlapping extensions of the modal meanings, such as necessity and obligation; prediction and volition; and prediction, possibility and hypothetical meaning, make the categorisation challenging. Quirk et al. (1985) suggest that the meaning of a modal can vary on a gradient between the intrinsic and the extrinsic categories (section 2.3.3 above). This suggests that it is possible to get a combination of meanings, or indeterminate examples.

Such difficulties surrounding the English modal auxiliaries have inspired the adaptation of a "fuzzy set theory" for dealing with the indeterminacy of modal meanings (Coates 1983). Coates suggests that it is critical to understand indeterminacy in order to understand modality (1983: 11). She found that many examples in her data were hard to classify on a cline between two clearly distinct extremes. She therefore suggested that a "fuzzy set theory" could provide a model for understanding the indeterminacy she observed in her data. A 'fuzzy set' is by Coates used to mean; "a class in which the transition from membership to non-membership is gradual rather than abrupt" (Zadeh 1972: 4; in Coates 1983: 13). She uses general terms like 'core', 'skirt' and 'periphery' (see, Coates 1983: 12, fig. 2.2), where the core meaning of an MA corresponds to the cultural stereotype and is the one "first learned by children" (1983: 13). The 'skirt' and 'periphery' presents the intermediate continuum where meaning is considered as gradient between the core and the periphery.

In the data a few such 'fuzzy' examples occur. One example is the occurrence of the MA *will* in ex. (30) below. The MA *will* can express meaning on the gradient of volition and prediction (Quirk et al. 1985: 221). Coates suggests that *will* represents a rather fuzzy set of interrelated meanings, and that these are "closely related to concepts of futurity" (1983: 169-170). Ex. (30) is an example where *will* produces a combination of volition (intrinsic) and prediction (extrinsic):

(30) And tomorrow, we will dump a slightly larger amount, with the cumulative concentrations now trapping more and more heat from the sun. (G, 10)

Here, *will* produces the meaning of prediction, in the sense that Gore expresses how likely he thinks this prediction is. In other words, he utters his confidence about something he judges is likely to (continue to) happen in the near future. On the other hand, in this context *will* also involves a sense of human control over the events (volition), thus there is a combination of meanings.

This fuzziness also raised itself in one example of the MA *should*, which can be used to offer advice (Coates 1983). This paper suggests that ex. (31) is a case of 'merger' between necessity and obligation – necessary obligation or obligated necessity. In a merger "the two meanings involved are not (…) mutually exclusive" (Coates 1983: 17).

(31) Both countries should stop using the other's behavior as an excuse for stalemate and instead develop an agenda for mutual survival in a shared global environment. (G, 50)

In ex. (31), *Both countries* (the United States and China) conveys two responsible parties, and the MA *should* is used to express a piece of advice. Arguably, *should* in ex. (31) implies a sense of necessity. Contextual circumstances suggest that the speaker expresses advice for a course of action, a need to take responsibility, and a need to change direction. Thus, *should* in ex. (31) can be said to express the speaker's judgment of necessity for the two countries to *stop using the other's behaviour as an excuse*…. However, *should* also entails obligation, evident from the context as well, since the speaker has included a piece of explicit advice.

The fact that the speaker explicitly suggests that the *countries* should cooperate, supports the idea that the speaker thinks the same countries have an obligation to stop making excuses and start taking responsibility. Quirk et al. (1985) note that unlike *must*, *should* does not imply the speaker's confidence that the Subject will follow the advice. The discussion in section 4.5 below will illustrate that obligation and necessity are closely linked when Gore expresses advice in his text.

In addition to examples (30) and (31), the data also revealed some occurrences of MAs expressing hypothetical prediction (by means of *would*) and hypothetical possibility (by means of *could*) (sections 4.4.2 and 4.4.4 below). This is a possibility because *would* can adopt the abilities of *will*, representing the latter in 'past form', whereas *could* can function as the 'past form' of *can* (Coates 1983), such as in examples (32) and (33):

(32) Essentially, the range of global GDP reduction with the least-cost trajectory assessed for this level of stabilisation would be less than 3% in 2030 and less than 5.5% in 2050. (P, 24)

(33) Neglect in protecting our heritage of natural resources could prove extremely harmful for the human race and for all species that share common space on planet earth. (P, 6)

Both prediction and possibility are categorized as extrinsic modality (section 2.3.3 above), which involves an element of human evaluation or judgement. This paper suggests that the context in ex. (31) and ex. (32) contributes to the hypothetical meaning, and that the MAs add the human evaluation of prediction and possibility respectively, on top of this. The tentativeness related to these modals emphasise the sense of hypothetical meaning.

2.6 Summary of the terminology

This work focuses on modality as expressed through MAs (Quirk et al., 1985), marginal auxiliaries (including semi-auxiliaries and catenatives), and content disjuncts – and of these, the disjuncts expressing modality (possibility, necessity and prediction, and permission, obligation and volition). The modal meaning of usuality and the label 'modal metaphors' are adopted from Halliday (1994). I use 'extrinsic meaning' and 'intrinsic meaning', which in SFL correspond to 'modalization' and 'modulation', respectively. I have used the verb categorisation provided in Quirk et al. (1985), for an easy classification of the various modal expressions, and when necessary, I refer to Halliday's (1994) scales of low, median and high for the value of modality. The theory of hypothetical meaning is drawn from Coates (1983), Quirk et al. (1985), and Palmer (1990). When discussing indeterminate cases, I have considered the 'fuzzy set theory' (cf. Coates 1983).

2.7 Concluding remarks

This chapter has established the present modality analysis within the theoretical framework of Systemic Functional Linguistics and the interpersonal metafunction. It has outlined a broad methodological framework for analysing modality, which, in addition to MAs, contains marginal auxiliaries, content disjuncts, and modal metaphors. The study draws on two

theoretical models for classifying modal expressions – the first a systemic functional grammar, the second Quirk et al's reference grammar.

The first part of the chapter focused on the clause and its interactive capacity. This includes the speaker's choice of speech roles, the speech functions, and the commodity exchange. The clause enacts the social relationships between the speaker and the hearer. Thus, considering the clause within the interpersonal metafunction helps clarify how a text is organised in order to make the hearer understand a message, or in order to engage the hearer.

The second part of the chapter considered modality, which conveys the speaker's attitude towards a proposition. A section on hypothetical meaning was included as the data revealed relatively many examples of hypothetical situations, and showed different strategies for expressing hypothetical meaning. This part of the chapter also presented a discussion to illustrate the various 'fuzzy' categories that occur in the data.

Chapter 4 will apply the framework to the data. The discussion aims to show that the two speakers have chosen two different strategies for presenting their texts and communicating their goals. The next chapter will consider some complexities involved in communicating climate change.

3: Communicating Climate Change

Studies on climate change note the complexities involved in understanding the underlying science (Sterman and Sweeney 2007; Maibach, Roser-Renouf, and Leiserowitz 2008). For instance, it is difficult to understand some of the terminology and the physical processes. It can also be difficult to understand how our behaviour contributes and to see the extensions of our actions on the future. The following presentation will illustrate that language itself can make the issue of climate change difficult to grasp, but also, that language can be used to increase people's understanding, and by extension, their engagement.

3.1 Understanding scientific language

In an article in the journal *Climate change*, Sterman and Sweeney (2007) report on experiments with graduate students at MIT. These subjects were highly educated in e.g. science and mathematics. The researchers wanted to assess whether highly intelligent adults understand the basic processes affecting the climate, and in particular "the relationship between atmospheric GHG concentrations and flows of greenhouse gases [GHG] into and out of the atmosphere" (Sterman and Sweeney 2007: 236, abbreviation added). The subjects were presented with a short non-technical summary, similar to what would be suitable for a policymaker or intelligent layperson, and were next given a scenario for the evolution of CO_2 in the atmosphere (2007: 216). The subjects were then asked to describe the emissions trajectory required to realise it. In order to reduce potential response bias three different question formats were tested. Briefly summarised, Sterman and Sweeney noted that their subjects believed GHG concentrations in the atmosphere can be stabilised even as emissions *into* the atmosphere *exceed* the removal of GHGs from the atmosphere. The results revealed widespread misunderstanding of the relationship between GHG emissions and GHG removal from the atmosphere (the stock and flow relationships (ibid: 213)). Sterman and Booth Sweeney further suggest that this perception is "analogous to arguing a bathtub filled faster than it drains will never overflow" (2007: 213). The fact is that concentrations of GHG in the atmosphere will fall only if emissions drop below removal from the atmosphere (ibid: 215).

The results indicate the complexities involved in understanding the issue of climate change, not at least for the general public, who, on average, is not familiar with the technical details of climate change, CO_2 reduction, and CO_2 concentrations etc.

Sterman and Sweeney claim that most scientific reports on climate change contain much technical detail. They note that the IPCC reports, including the IPCC's Summary for Policymakers, which is intended for non-scientists (the public and policymakers), is not presented in a way that the general public can understand (2007: 232, 235). Their concern is that due to a lack of understanding of the underlying basic physics (the stock and flow relationship of GHG emissions and removal into and from the atmosphere), the public will hesitate to support, and the policymakers will hesitate to adopt, necessary mitigation policies.

Pachauri's text contains technical language that may be difficult to understand:

1. For **a CO2-equivalent concentration at stabilization of 445-490 ppm**, **CO2 emissions** would need to **peak during the period 2000-15 and decline thereafter**. (P, 24)
2. There is medium confidence that **approximately 20%-30% of species** assessed so far are likely to be at **increased risk of extinction** if **increases in global average warming** exceed **1.5-2.5 °C, relative to 1980-99**. (P, 12)

It is not easy to perceive the warnings if you do not understand the message. Compare the following examples from the G-text, and it is clear that the speaker goes a long way to explain in terms that are more familiar for non-scientists:

3. So today, we dumped another **70 million tons of global-warming pollution** into **the thin shell of atmosphere surrounding our planet, as if it were an open sewer**. And tomorrow, we will **dump a slightly larger amount**, with **the cumulative concentrations** now **trapping more and more heat from the sun**. (G, 10)
4. Now science is warning us that if we do not quickly **reduce the global warming pollution** that is trapping so much of the heat our planet normally radiates back out of the atmosphere, we are in **danger of creating a permanent "carbon summer."** (G, 24)

What these examples illustrate is that the two speakers uses different 'levels of technical language' to indicate the possible effects of climate change. From these examples, it can be suggested that Gore uses a communicative style that is more familiar for most people, whereas Pachauri uses a communicative style that is more suitable for someone familiar with the scientific details.

Sterman and Sweeney suggest, "Effective communication about climate change should help people understand these relationships [the stock-flow relationship] in familiar terms". The researchers propose that the misconceptions of 'climate dynamics' may explain

low public support for mitigation policies as such beliefs "favour wait-and-see policies, but violate basic laws of physics" (2007: 216).

Halliday (1993) considers the complexities of 'scientific English'. He suggests that technical terms and conceptual structures related to scientific knowledge are often complex and distant from everyday experience (1993: 70). This makes scientific language hard to understand, but sometimes it is made more difficult than necessary. Halliday suggests that most of these difficulties originate in the grammar, and not in the vocabulary (1993: 71). This is related to the difficulties in defining a technical term without reference to another technical term. Halliday (1993) considers for instance 'grammatical metaphor' as one process that may contribute to the difficulties of understanding a scientific text (cf. 1993: 69-85, also section 2.3.5 above). He suggests that they depersonalise and objectivise the discourse. In addition, Halliday mentions interlocking definitions, technical taxonomies, special expressions, lexical density, syntactic ambiguity, and semantic discontinuity.

3.2 Effective climate change messages

Maibach, Roser-Renouf, and Leiserowitz (2008) consider how communication and marketing may influence population behaviour towards climate change prevention and adaptation goals. Maibach et al. (2008) examine, from a current US public health perspective, how communication and marketing can influence people's perception of climate change prevention and adaptation objectives. One of the things they considered was the characteristics of effective climate change messages. The motivation of Maibach et al. lies in the proposed scenarios that climate change will have serious health effects. Pachauri mentions it in his speech:

> 5. **The health status of millions of people is projected to be affected** through for example, increases in **malnutrition**; increased **deaths**, **diseases**, and **injury** due to extreme weather events; increased burden of **diarrhoeal diseases**; increased frequency of **cardio-respiratory diseases** due to higher concentrations of ground-level ozone in urban areas related to climate change; and the altered spatial distribution of **some infectious diseases**. (P, 11)

Maibach et al. (2008) examine the benefits of communication for increasing a public health response to climate change. They define communication as "the production and exchange of information to inform, influence, or motivate individual, institutional, and public audiences" (2008: 489). They propose that the important target audiences to consider for climate change communication are the local, state, national, and multinational government organisations

(2008: 492), as they are the decision makers, or have the power to influence the decision makers.

Maibach et al. (2008) recommend that effective climate change messages should comprise fear appeals with accompanying strong efficacy-enhancing information (cf. section 5.3), as they note that literature on climate change contains warnings precisely to avoid fearful messages (2008: 494). They suggest that fear appals may be effective tools for gaining support. They propose that any potential fearful information should be followed by strong efficacy-enhancing messages that include actions for how the threat can be limited. They also recommend customised descriptions of the potential impacts. A survey indicated that people were more concerned about the threat of global warming to future generations, than to themselves or to all life on earth (2008: 495). In other words, a person who is not personally engaged in, or lives far away form, the impacts of a projected threat may not care about the consequences for the polar bears if the North Polar ice melts.

Furthermore, Maibach et al. argue that the climate change debate lacks an effective metaphor to summarize and clarify this complex issue (ibid: 495, 496). The climate change is complex; many people do not understand the basic science or the effects of human behaviour, as the study by Sterman and Sweeney (2007) suggest. As metaphors engage people on a cognitive level, they are a powerful means of communication. Framing a message can also be effective in the climate change debate. They suggest e.g. the 'economy frame', the 'energy independence frame', and the 'legacy frame'.

3.3 Relevance to the present study

The objectives of these two studies are interesting to consider in terms of the data in the present study, whose communicative goals include the communication of climate change (see section 1.5.3).

Sterman and Sweeney (2007) suggest the importance of the complexities of climate change issues to be communicated in a manner that will increase public support (the voters) for mitigation policies and adaptation measures. Maibach et al. (2008) suggest that the policymakers, and others that may influence decisions on local, state and international level, should be considered an important target audience. The latter scholars also suggest communicative approaches that are effective: fear appeals, effective metaphors, customised descriptions of potential threats, and framing. Some of these are discussed in their own right

in chapter 5, while they are also relevant to some of the discussion of modal meanings presented in chapter 4. The next two chapters will consider further how the speakers make use of language to communicate a message.

4: Modality in the texts: discussion

This chapter presents the results of the analysis performed on the basis of the framework outlined in chapter 2. In a small-scale qualitative study, such as this one, there is room for considering examples that do not fit in the usual categories, and they may provide an interesting discussion and a deeper understanding of the speaker's communicative strategies. Thus, it is useful to adopt a framework that opens up for modality being conveyed in a range of expressions.

4.1 Presenting the results

Table 4.1 below illustrates how frequently modality and hypothetical meaning occurs in each text. The percentages should be taken lightly as this is not a quantitative study with large categories. The highest number of any modal meaning is the 20 appearances of modal expressions conveying prediction in the P-text. Thus, the total numbers are low, which means that the percentages will change radically with even a small adjustment in the totals. Still, the percentages make it easier to compare the texts, even though the interesting point is rather the types of modal expressions, the types of modal meaning that occur in the texts, and the contexts in which they occur.

As mentioned in section 2.3.3, ability is considered a special case of possibility (Quirk et al. 1985), which is why the two are presented together (section 4.2), but are still treated as separate extrinsic categories in this thesis. Hypothetical meaning and usuality are listed in bold because they are not included in the categorisation of extrinsic and intrinsic meaning in Quirk et al. (1985). Categories 6), 7) and 9) (also in bold) are necessary for explaining several of the 'fuzzy' examples from the texts (section 2.5 above), and they indicate that modality does not always express a distinct meaning. The results are listed in the table in the order in which they are presented in the discussion below; the shaded and white areas represent the groups that are presented together.

Table 4.1: The no. of modal expressions and hypothetical meaning in the texts

	MODAL AND HYPOTHETICAL MEANING	P-text		G-text	
		No.	%	No.	%
1)	Possibility (extrinsic)	15	≈16.5	13	≈15.1
2)	Ability (extrinsic)	4	≈4.4	4	≈4.7
3)	Prediction (extrinsic)	20	≈21.9	10	≈11.6
4)	Volition (intrinsic)	1	≈1.1	11	≈12.8
5)	Hypothetical meaning	14	≈15.4	13	≈15.1
6)	**Hypothetical prediction (extrinsic)**	15	≈16.5	5	≈5.8
7)	**Hypothetical possibility (extrinsic)**	12	≈13.2	1	≈1.2
8)	Necessity (extrinsic)	4	≈4.4	9	≈10.5
9)	**Necessity (extrinsic) ↔Obligation (intrinsic)**	-	-	11	≈12.7
10)	Obligation (intrinsic)	1	≈1.1	2	≈2.3
11)	Permission (intrinsic)	1	≈1.1	-	-
12)	**Usuality**	4	≈4.4	7	≈8.1
	Total	**91**	**100**	**86**	**100**

Except for permission, which does not occur in the G-text, all the different extrinsic and intrinsic modal meanings occur in both texts. Totally, the hypothetical group – consisting of groups 5), 6), and 7) – is the largest group in the P-text. As noted above, the numbers are low, so it is difficult to generalise about the frequency of modal and hypothetical meanings occurring in similar texts. Between the two texts in question, however, it is possible to comment on visible patterns. For instance, groups 5), 6), and 7) comprise approximately 45% of the examples from the P-text, but only approximately 22% of the examples from the G-text.

Table 4.1 further illustrates that possibility and hypothetical meaning (alone) rank high in both texts. Individual results for the two texts reveal that prediction, hypothetical prediction, and hypothetical possibility ranks high in the P-text. In the G-text, there is not that much difference between volition, necessity↔obligation, prediction, and necessity. The results from the P-text illustrates that the text is relatively full of hypothetical situations, predictions and possible events or circumstances. By comparison, the G-text shows a more even spread of 'meanings' even though hypothetical meaning ranks highest as an individual group. Consequently, even though the number of each modal meaning in the data is low, table 4.1 illustrates that the two speakers use very different communicative strategies.

4.2 Possibility and ability

When possibility is expressed by means of the modal auxiliary (MA) *can*, the possibility is paraphrasable by *it is possible to* (…). The modal meaning of ability expressed by *can* is

paraphrasable by *be able to* or *be capable of*, or *know how to*. When the MA *may* expresses possibility, *may* is paraphrasable by *it is possible that* (…) (see below for examples).

4.2.1 Possibility in the G-text

A quick glance at table 4.2 reveals that among the ways of expressing possibility, Gore does not seem to prefer one particular strategy.

Table 4.2: Possibility in the G-text

Modal: meaning→ expression↓	**Possibility (extrinsic)** **No.**
Can	2
Could	3
May	1
Might	2
Will	1
Seem to	1
Modal disjunct	1
Adjective	1
Modal metaphor	1
Total	**13**

In ex. (1), the speaker explicitly states his judgment that it is possible to achieve a *bright and hopeful* future:

(1) These are the last few years of decision**,** but they can be the first years of a bright and hopeful future if we do what we must. (G, 51)

Here, the speaker targets the general public *and* the decision makers, as he suggest that we *all* must do what is necessary. This is an appeal to the audience's pathos.

The speaker expresses on more than one occasion, that we must rethink some of the 'old ways', that is, change how things are now. By means of *may* the speaker suggests that it is likely that the *innovators* will be born and raised in Nigeria, India, or Uruguay:

(2) The innovators who will devise a new way to harness the sun's energy for pennies or invent an engine that's carbon negative may live in Lagos or Mumbai or Montevideo. (G, 37)

In ex. (2), Gore suggests that the problem is not only something that people in the 'western' world can solve. The example presents in familiar terms what should be done to further a constructive development.

In the following example, the speaker is inviting a change of political leadership. The MA *may* is paraphrasable by *perhaps*, which suggests that *may* and *perhaps* are related in meaning. The disjunct *perhaps* expresses some degree of doubt; in the sense that it is possible that there is no political will to initiate the 'start':

(3) We have everything we need to get started, save perhaps political will, but political will is a renewable resource. (G, 58)

In ex. (3), the meaning of *perhaps* sums up Gore's opinion about this proposition, what he deems to be the truth about politicians' will to act. The phrase *but political will is a renewable resource* expresses a grain of hope, and reminds the audience that they have the power to initiate the change, because they have the power to vote. A change of political leaders implies a change in policies, and the audience elect the politicians, thus the speaker addresses the audience as voters.

Example (4) expresses a warning about the impacts of global warming. When possibility is expressed through *could*, the meaning attached to the proposition is one of tentativeness:

(4) … the North Polar ice cap is "falling off a cliff." One study estimated that it could be completely gone during summer in less than 22 years. (G, 13)

The extract in ex. (4) communicates a scientific prediction, and the communicative style adopted here, is more impersonal than in ex. (3). Still, Gore uses simple vocabulary to express the warning. As illustrated by the tentative meaning implied in *could*, the proposition presented does not express an actual truth, as nobody knows for certain exactly when the North Polar ice cap will be gone during summer.

In ex. (5), the speaker expresses his personal assessment, and the modal meaning is that of probability. The modal meaning is expressed explicitly and objectively through the modal metaphor. This frames the speaker's opinion of the proposition in the main clause (this example is discussed as ex (19), section 2.3.4):

(5) While India is also growing fast in importance, it should be absolutely clear that it is the two largest CO2 emitters - most of all, my own country -- that will need to make the boldest moves, or stand accountable before history for their failure to act. (G, 49)

Clear is modified by the intensifier *absolutely*, which adds additional emphasis to the speaker's assessment of the information. The structure of ex. (5), allows the proposition to be presented as a given fact. China and the United States are described as *the two largest CO2 emitters*, in which definite article *the* helps present this as a presupposed fact. Here, the

speaker targets the decision makers, and the evaluation in the modal metaphor is a way for the speaker to put an opinion 'out there' without explicitly claiming modal responsibility.

As noted above, the speaker's communicative style is personal and inclusive. Only in the examples presented here, there are instances of self-referencing and several personal pronouns.

4.2.2 Ability in the G-text

The MAs do not crop up frequently to express ability in any of the texts. In the G-text this might be a result of the speaker's focus on what 'must' be done, rather than what 'we are capable of' (cf. table 4.10 below).

Table 4.3: Ability in the G-text

Modal: meaning→ expression ↓	**Ability (extrinsic)** **No.**
Can	3
Cannot	1
Total	**4**

The first example, in which ability is expressed by *can*, is when Gore gives an assessment, or a judgment, of his own abilities as a speaker and communicator at the beginning of the lecture:

(6) Even though I fear my words cannot match this moment, I pray what I am feeling in my heart will be communicated clearly enough that those who hear me will say, "We must act." (G, 6)

The modal *cannot* in ex. (6) expresses high value modality (see table 2.2 above), with negative polarity. The occurrence of *will* in this context resembles the possibility sense of *can*.

This use of modality invites the audience to consider the speaker as a modest, honest, and dedicated person (ethos, section 1.6). Simultaneously, the negative polarity helps put emphasis on the urgency of Gore's communicative goal (*we must act*). Here, Gore again targets the general public *and* the decision makers (cf. ex (1)). Therefore, the fact that the speaker takes time at the beginning of his speech to express this metalinguistic comment is probably not coincidental.

The other contexts where Gore uses *can* to express ability is related to our attempts at solving the problems related to the climate changes, ex. (7); and the personal changes we may feel if we decide to rise to this challenge, ex. (8):

(7) We must abandon the conceit that individual, isolated, private actions are the answer. They can and do help. But they will not take us far enough without collective action. (G, 35)

(8) When we unite for a moral purpose that is manifestly good and true, the spiritual energy unleashed can transform us. (G, 38)

In ex. (7), ability refers to the *individual, isolated, private actions*, and their capabilities for being the necessary solution. In ex. (8), Gore appeals to the hearers' sense of morality and desire for personal growth, by referring to the qualities that comes with *a moral purpose* that is *good and true*, and its ability to *transform us*. Again, he appeals to the recipients' pathos. In both examples, the speaker encourages unity and global cooperative effort, through what could be called a 'global collaboration' frame.

By means of inclusive *we* Gore creates an 'in-group' consisting of himself and the audience. This communicative strategy appears because of the speaker's choice of *we* as Actor in ex. (7) and ex. (8).

4.2.3 Possibility in the P-text

In the presentation of possibility in the P-text, the communicative style of the speaker does not parallel the personal and speaker/hearer-inclusive style in the G-text.

Table 4.4 illustrates that there is less variety in the modal expressions in the P-text, than in the G-text. *Can* expressing possibility occurs more frequently in the P-text than in the G-text (cf. table 4.2). Additionally, this is the most frequent strategy for expressing possibility in the P-text.

Table 4.4: Possibility in the P-text

Modal: meaning → expression ↓	**Possibility (extrinsic) No.**
Can	7
Could	2
May	3
Adjective	1
Modal metaphor	2
Total	**15**

In the following examples, Pachauri expresses warnings about the expected, projected, or possible consequences of climate change, ex. (9), and ex. (10). Pachauri expresses his judgment of the possibility that the future situation for certain societies and individuals looks grim, considering their potential abilities to deal with the impacts of climate changes:

(9) And, given the inadequacy of capacity, economic strength, and institutional capabilities characterizing some of these communities, they would remain extremely vulnerable to the impacts of climate change and may, therefore, actually see a decline in their economic condition, with a loss of livelihoods and opportunities to maintain even subsistence levels of existence. (P, 7)

(10) Those systems and communities, which are vulnerable, may suffer considerably with even small changes in the climate at the margin. (P, 25)

In both ex. (9) and ex. (10), the proposition is hedged by the use of *may*. The reason for the tentativeness is likely to stem from uncertainties involved in talking about the future, and the possible consequences of something that may or may not happen. The modal value attached to *may* is low (see table 2.3 above).

Examples (9) and (10) are warnings intended to evoke empathy for *some of these communities* and *those systems and communities, which are vulnerable*. Emphasis is added by *actually* in ex. (9), and by *suffer considerably* in ex. (10). As mentioned in chapter 3, scientific language can be hard to understand, and by extension, it may be difficult to understand fully the seriousness of a message. Maibach et al. (2008) suggest that if people are not able to follow the discussions of projected impacts of climate change, they may become apathetic (2008: 495).

A lot of the P-text revolves around the issue of projected or possible consequences of climate change; however, most of these propositions are expressed with a stronger sense of hypothetical future and prediction, rather than one of possibility (see further sections 4.4.3 and 4.4.4).

Pachauri also talks about the extension of the work of the IPCC, ex. (11). The first clause provides important information to the hearer about the restrictions that apply to the IPCC (cf. section 1.5.2.2 above):

(11) Since the IPCC by its very nature is an organization that does not provide assessments, which are policy prescriptive, it has not provided any directions on how conflicts inherent in the social implications of the impacts of climate change could be avoided or contained. (P, 7)

The MA *could* adds a sense of tentativeness to the proposition in the example. The *inherent conflicts* in ex. (11), is presented as an unavoidable consequence of the impacts of climate change. This way, the speaker ties the impacts of climate change to conflict.

In ex. (11), the speaker makes it explicit that the IPCC does not provide policy prescriptive assessments. Since Pachauri represents the IPCC on this occasion, this will

influence the types of speech acts he can allow himself to express. It is likely that it will also affect the degree of alarm in his propositions. Furthermore, since he is not expected to express any advice, orders, or commands, it can be predicted that he will not use many MAs that express a high degree of obligation, such as *should*, *must*, and also HAVE *to*, and *ought to*. In fact, there are only three occurrences of *must* in the P-text (see table 4.12 below). None of the other MAs of high value modality occurs in the P-text (cf. table 2.3 above).

In ex. (12), another reference is made to the link between the works of the IPCC on the one hand, and peace and security on the other. Here, Pachauri targets *other scholars* and implies that the IPCC's knowledge is relevant for future policies on peace and security:

(12) Nevertheless, the Fourth Assessment Report provides scientific findings that other scholars can study and arrive at some conclusions on in relation to peace and security. (P, 7)

The speaker suggests that, even without providing policy prescriptive assessments, the IPCC is an important *external* source of information, which *it is possible* for others *to* study.

In the next example, Pachauri provides an assessment for how to limit the impacts of climate change; this corresponds to efficacy – information (see sections 3.2 above; 5.3 below):

(13) The impacts of climate change can be limited by suitable adaptation measures and stringent mitigation of greenhouse gas emissions. (P, 20)

With a paraphrase such as *it is possible to limit the impacts of climate change by…*, it becomes even clearer that Pachauri here expresses some type of judgment of how possible it is to do some preventative damage control. He also presents some general guidelines (*suitable adaptation measures and stringent mitigation of greenhouse gas emissions*) without being explicit as to how they should be adapted. This example reflects the nature of the IPCC; it keeps away from policy prescriptive assessments, but it does provide assessments for mitigation and adaptation strategies (cf. ex. (11) above).

Example (14) is interesting because it presents the speaker's views on how things should be, or should be understood. Probability is expressed through the MA and the adjective in the modal metaphor (as in ex. (5) above). In the example, the speaker introduces someone else's words on stage, thus framing how he thinks these words should be perceived while using them to emphasise a point. The modal metaphor allows the speaker to express his opinion without expressing modal responsibility:

(14) It would be relevant to recall the words of President Gayoom of the Maldives at the Forty Second Session of the UN General Assembly on the 19 October 1987: (P, 27)

There are reasons why *the words of President Gayoom* were included and the words chosen to introduce the quote mirrors what the speaker thinks (*I think it is relevant…*). This suggests to the hearers how *the words of President Gayoom* should be considered (they are *relevant*). Thus, the hearers are invited to share the speaker's views. The modal metaphor provides an explanation for why the following quote was included, as a metalinguistic comment.

4.2.4 Ability in the P-text

Ability is only expressed by means of *can* in the P-text (4 times), thus, I do not include a table to illustrate this. The following presentation of ability in Pachauri's text will show that the speakers differ significantly in communicative style and topics.

Ability conveyed through *can* expresses the speaker's judgement of the abilities and capabilities of something:

(15) The IPCC Fourth Assessment Report concludes that non-climate stresses can increase vulnerability to climate change by reducing resilience and can also reduce adaptive capacity because of resource deployment towards competing needs. (P, 15)

In ex. (15), the speaker is concerned with the abilities of *non-climate stresses* to reduce *adaptive capacity* and *resilience* to climate change. There is also a sense of possibility implied in *can*. That is, since the speaker deems it likely that *non-climate stresses* are able to *increase vulnerability* (…) the speaker also conveys that there is a possibility that this will happen. This extract reflects the style Pachauri adopts when he presents scientific findings. The terminology is quite technical, and thus is may be difficult to perceive that ex. (15) provides a warning.

(16) There are multiple drivers for actions that reduce emissions of greenhouse gases, and they can produce multiple benefits at the local level in terms of economic development and poverty alleviation, employment, energy security, and local environmental protection. (P, 23)

Example (16) provides efficacy information, and some suggestions as to how mitigation policies can benefit people *at the local level*. *Can* in ex. (16) refers to the abilities of the *actions that reduce emissions of greenhouse gases*, thus, the speaker targets both the general public, and the local policymakers.

Chapter 2 introduced the idea of 'modal responsibility' (section 2.3.5.1 above), which is interesting to consider with examples like the two above. Only ex. (15) presents a responsible

Subject, since *the IPCC…Report* is allocated to the Subject position in the main clause. In addition, the audience know that the speaker represents the IPCC, and by extension, he too *could* be included in the Subject. Omitting a responsible Subject means that the hearers are not provided with a source to agree or contradict with (cf. section 2.2.1.1 above). Acceptance or rejection of a given fact may then rely on the hearer's faith in the speaker, their knowledge, and the speaker's knowledge and understanding (cf. ethos, section 1.6 above).

4.2.5 Observations on possibility and ability

The analysis revealed no significant difference in how many times the two speakers express possibility and ability in their texts. Both speakers express ability by means of *can*, and there is only one occurrence of *cannot* in the G-text. There is a greater difference between how the speakers express possibility. Although the numbers are low, table 4.4 reveals that *can* is used most by Pachauri to express possibility, followed by *may* and two modal metaphors. Gore applies more strategies, so the number of occurrences per modal expression is lower. *Could* is used three times and *can* and *might* are both used twice by Gore.

A thread connecting the texts is that they both include warnings and suggestions that we have to act now to change what could possibly happen. Both texts target the general public *and* the policy makers. However, the speakers' communicative styles differ in terms of technical language. Thus, some of the warnings in the P-text may be harder to understand, as it may be more difficult to understand fully the arguments.

Unlike Gore, Pachauri does not use self-reference, nor does he include personal pronouns or reflexive pronouns in these examples. The result is a text where, sometimes, the sources of the opinions expressed are not immediately obvious, and the examples do not appear to express the speaker's opinions. Pachauri uses possibility when he talks about possible consequences of climate change, and he provides warning assessments that are intended to encourage responsibility. Pachauri explicitly mentions the restrictions that apply to the IPCC, which explains why his text is primarily informative and provides assessments and not directives. By means of *can* expressing ability, Pachauri presents warning consequences, but also positive information.

Gore's communicative style is quite different from the style adopted by Pachauri. Gore shows a more personal commitment than does Pachauri; he uses self-reference (*I*) and inclusive *we*, he also includes personal thoughts. By means of inclusive *we* the speaker creates an 'in-

group'. When expressing possibility, Gore encourages political change and suggests that we must adopt a global perspective. He also places responsibility, but without expressing modal responsibility. He uses ability to express doubts about his own abilities as a speaker.

4.3 Prediction and volition

When *will* expresses prediction, the paraphrase *I predict that* (…) + a future time reference is implied. Furthermore, expressing prediction through *will* involves a reading of the proposition which suggests that the "speaker's confidence is based on common sense, or on repeated experience" (Coates 1983: 177). This is for example the case in ex. (19) below.

Will expressing volition may indicate the speaker's insistence, as in ex (20) below. Volition involves some kind of human control over events (see Quirk et al.'s intrinsic meaning, section 2.3.3 above)

4.3.1 Prediction in the G-text

Prediction in the G-text is only expressed by *will*, whereas in the P-text, another strategy is used in addition to the MA (see further table 4.7).

Table 4.5: Prediction and volition in the G-text

Modal meaning→	**(Extrinsic)**	**(Intrinsic)**
	Prediction	**Volition**
Modal expression↓	**No.**	**No.**
Will	10	4
Would		4
Want to		1
Catenative		2
Total	**10**	**11**

When he applies prediction, Gore urges for change, see ex. (17), and he introduces responsibility, ex. (18).

In ex. (17), the speaker talks about the necessity of collective action:

(17) We must abandon the conceit that individual, isolated, private actions are the answer. They can and do help. But they will not take us far enough without collective action. (G, 35)

Will in ex. (17) expresses the common sense of future prediction. *They* (individual, isolated, private actions) are not enough to change the future. Here, the speaker targets both the general public and the policy makers, as *collective action* depends on all of us. A notion of 'new approach' is embedded in ex. (17) in the implied contrast of *private actions* and *collective action*. By suggesting *collective action* the speaker can be seen as introducing a 'global

collaboration' frame (Maibach et al. (2008) suggest framing as an effective tool in communicating climate change, see section 3.2 above,).

In ex. (18), the speaker projects the voice of future generations:

(18) The future is knocking at our door right now. Make no mistake, the next generation will ask us one of two questions. Either they will ask: "What were you thinking; why didn't you act?" Or they will ask instead: "How did you find the moral courage to rise and successfully resolve a crisis that so many said was impossible to solve?" (G, 56-57)

By means of *will* Gore expresses his judgment that he thinks it is likely that this generation will have to stand accountable for future generations. The speaker invites the audience to reflect on the threat to future generations, and thus, he frames the message by a 'legacy frame'. Furthermore, the speaker presents two possible scenarios. Either the present generation will have to defend that they did not act, or, they will be praised for the actions they did perform. This strategy suggests a contrast between good and bad. In ex. (18), it is an eloquent strategy, which is intended to influence the audience by appealing to their pathos (section 1.6).

Ex. (19) reflects a personal commitment:

(19) So today, we dumped another 70 million tons of global-warming pollution into the thin shell of atmosphere surrounding our planet, as if it were an open sewer. And tomorrow, we will dump a slightly larger amount, with the cumulative concentrations now trapping more and more heat from the sun. (G, 10)

In ex. (19), *will* expresses future prediction, and extrinsic modality. The speaker is predicting the negative actions that are likely to occur *tomorrow*; an assumption based on the speaker's current knowledge and observations. The language in ex. (19) presents the greenhouse effect in a simple manner, where the speaker avoids technical terms.

The use of inclusive *we* makes the proposition come across as less accusing than if the speaker had used *they* or *you*. This strategy is applied in the G-text on several occasions (see section 4.5*ff*). It establishes an equal platform for the speaker and the audience he approaches. Both the speaker and the audience are presented as part of the problem, while simultaneously, the speaker also urges for a solution to the problem.

4.3.2 Volition in the G-text

Like ex (19) above, also ex. (20) reflect a personal commitment:

(20) So I want to end as I began, with a vision of two futures - each a palpable possibility - and with a prayer that we will see with vivid clarity the necessity of choosing between those two futures, and the urgency of making the right choice now. (G, 54)

In ex. (20), the speaker expresses in simple terms his desires for 'us' to see the choice we need to make, and to realise that we need to do this now. The MA *will* in ex (20) expresses the speaker's hopes as to what he wants 'us' to *see*. Arguably, *will* also expresses prediction, as this is something the speaker wants 'us' to see in the (near) future (cf. section 2.5 above). *Want to* expresses volition, and is directed towards the speaker's wish to end his speech.

Again, the inclusive *we* is a strategy for identifying with the audience. However, being the author, the speaker has already seen *the necessity* and *the urgency*, and has adopted this as a point of view, which he now presents to his audience. This is likely to contribute to strengthen the speaker's ethos, as he is presented as wise, committed, and responsible.

The following example is also likely to increase the speaker's ethos, as he expresses his commitment to solve the issue of climate change:

(21) I have prayed that God would show me a way to accomplish it. (G, 2)

The use of *would* in ex. (21) functions as the past form of *will* and it expresses willingness. Gore suggests that he has prayed or hoped, in the past, that God has willingness to show him the way, at any time from that moment in the past.

The proposition implies personal commitment because of the use of the pronouns *I* and *me* (in object position), which refer to the speaker. The proposition is an expression of the speaker's personal wants, needs, or desires: *I have prayed to God because I want God to show a way to accomplish it*. It is an interesting case because it expresses the speaker's desires for the proposition to come true, in a manner that could resemble prediction. Prediction, however, has some innate qualities that do not really fit this example. Predicting that God will do something is probably less likely than expressing a desire that God would do something.

Example (22) is another example of the speaker expressing his personal commitment. *Will* here conveys the speaker's intention:

(22) This week, I will urge the delegates in Bali to adopt a bold mandate for a treaty that establishes a universal global cap on emissions and uses the market in emissions trading to efficiently allocate resources to the most effective opportunities for speedy reductions. (G, 43)

Here, the speaker explains the chore he has, and expresses in familiar terms what he wants to see done: that *the delegates in Bali adopt a bold mandate* (…).

The catenatives *intend to* and *intend that* in ex. (23) convey intention:

(23) We never intended to cause all this destruction, just as Alfred Nobel never intended that dynamite be used for waging war (G, 16)

The speaker seems to suggest excuses for our behaviour, which caused this *destruction*. This term – *destruction* – is also a summary of the situation in Gore's view (see further section 5.3.1*ff*).

4.3.3 Prediction in the P-text

Table 4.6 illustrates that Pachauri expresses prediction in two ways, by the MA *will*, and by the use of semi-auxiliaries (cf. 'modal metaphors', section 2.3.5). The marginal auxiliaries come in the form of BE *expected to*, BE *projected to* and BE *likely to*. There are relatively many of them, and they reveal a communicative strategy, which will be discussed below.

Table 4.6: Prediction and volition in the P-text

Modal meaning→	**Extrinsic**	**Intrinsic**
	Prediction	**Volition**
Modal expression↓	**No.**	**No.**
Will	7	1
Semi-auxiliary	12	
Total	**19**	**1**

Some of the more technical explanations from the P-text are presented by means of prediction (cf. section 3.1 above). In ex. (24), Pachauri uses *will* to express prediction:

(24) In this regard, climate change will have several implications, as numerous adverse impacts are expected for some populations in terms of: (P 8)

The speaker here conveys how likely he judges this to happen. In this extract, the focus is on the impacts of climate change. An extrinsic (epistemic) reading of *will* implies that Pachauri judges it medium probable that the climate changes will engender several consequences in the future (cf. 'values of modality' in section 2.3.1). This statement contains information that can function as a warning from the giver of the information, to the recipients – the audience. Predictive *will* may also suggest that the speaker bases his confidence on common sense or familiarity with the topic (cf. section 4.3 above). In ex. (24), Pachauri's confidence is based on the results of the scientific research, which provide the basis for the IPCC's Fourth Assessment Report.

The modal metaphors appear in the summary sections of the text (54.5% of the paragraphs), where the speaker presents findings of projected or expected climate changes, consequently, the propositions contain many technical expressions (cf. table 4.7):[9]

(25) Some regions are likely to be especially affected by climate change. (P, 14)

(26) Climate change is expected to exacerbate current stresses on water resources. (P, 9)

(27) In Africa by 2020, between 75 and 250 million people are projected to be exposed to increased water stress due to climate change. (P, 9)

The common modal meaning of these semi-auxiliaries is that of prediction. In all the three examples, it is possible to substitute the semi-auxiliaries with the MA *will*, expressing prediction. A definition of *expected* is 'something that is *likely to happen or be true*' (Macmillan). Thus, the speaker assesses the likelihood of future predicted situations or events. Considering the information Pachauri presents, it is now easy to propose that the level of certainty attached to the propositions is low, or median high.

Table 4.7 (excerpts, see App. 2): Semi-auxiliaries expressing modality in the P-text

4 (P, 10)	Climate change could further adversely affect food security and exacerbate malnutrition at low latitudes, especially, especially in seasonally dry and tropical regions, where crop productivity **is projected to** decrease for even small local temperature increases (1-2 °C).
6 (P, 10)	Agricultural production, including access to food, in many African countries **is projected to** be severely compromised.
7 (P, 12)	There is medium confidence that approximately 20%-30% of species assessed so far **are likely to** be at increased risk of extinction if increases in global average warming exceed 1.5-2.5 °C, relative to 1980-99.
8 (P, 12)	Climate change **is likely to** lead to some irreversible impacts on biodiversity.
9 (P, 7)	One of the most significant aspects of the impacts of climate change, which has unfortunately not received adequate attention from scholars in the social sciences, relates to the equity implications of changes that are occurring and **are likely to** occur in the future.

The agent-less passive form in ex. (25), ex. (26), and ex. (27), and the other marginal auxiliaries (table 4.7, see also App. 2), adds distance to the source of this information. Of course, the audience are aware that Pachauri presents this lecture on behalf of the IPCC, and that his speech probably bases (some of) its information on the Fourth Assessment Report. However, the passive form removes the modally responsible Subject (cf. section 2.2.1.1 above), consequently the hearers are not provided with an obvious source to agree or contradict with (who deems it *likely*, who *expects*, who has *projected*?). Removing a source

[9] The summary of the Fourth Assessment Report constitute the technical parts of the P-text. It begins around paragraph 8 and lasts until paragraph 25, but there are transitional parts in paragraphs 7 and 26. The summary thus comprises approximately 18 of 33 paragraphs (54.5 % of the paragraphs).

situates the propositions at the focus of attention, and that is most likely the intention in a scientific context. In addition, Biber et al. (2006) note that 'short passives' are frequent in academic English, (cf. Biber et al. 2006: 937-938).

4.3.4 Volition in the P-text

There is only one occurrence of the modal meaning of volition in the P-text. It is expressed through the MA *will*, which conveys willingness:

(28) The question is whether the participants in Bali will support what Willy Brandt referred to as "reasonable politics". (P, 33)

The volition lies in the implied intrinsic human control held by the participants at the Bali meeting. The most important point of this example is who the speaker targets. Like Gore (cf. ex. (22) section 4.3.2), Pachauri targets the decision makers in this extract. He also challenges them by suggesting that if they do not choose *reasonable politics*, that makes them "unreasonable politicians".

4.3.5 Observations on prediction and volition

It is evident that the speakers differ in communicative style and topics. As table 4.1 illustrated, prediction occurs more often in the P-text (approximately 22% of the examples) than in the G-text (approximately 12% of the examples), and volition is more frequent in the G-text (approximately 13%) than in the P-text (1.1%).

Prediction is by Pachauri expressed by *will* and the semi-auxiliaries. Because of the framework adopted in this study, it was possible to comment upon the modality expressed through these semi-auxiliaries. These contribute to the impersonal impact of Pachauri's text, and they convey the interpersonal exchange between the speaker and his audience.

The uncertainty, or low degree of certainty, conveyed in the examples from the P-text, is likely to pertain to the difficulty in predicting these consequences. There are no personal pronouns in the examples from the P-text and the explanations of predicted impacts are all expressed in quite technical language, which may be difficult to understand for the audience.

It is likely that contextual factors play a part regarding the low number of examples expressing volition in the P-text. Pachauri represents the whole of the IPCC, which only provides assessments, and is policy-neutral (cf. chapter 1). Thus, by extension the speaker is not in a position to express wants, or to demand goods and services from the hearers.

Additionally, in the examples expressing prediction, Pachauri focuses on the impacts of climate change. Consequently, he adopts the speech role of giver, and the commodity exchange is information.

Gore uses *will* to express prediction, and he shows more variation in how he expresses volition, but *will* and *would* occur slightly more often. The frequency of MAs expressing volition by Gore may be brought about by the exact opposite reasons that apply for Pachauri. Gore represents himself, and is dedicated to convince people to act. Gore applies different strategies to reach this communicative goal. When he expresses prediction, he targets the general public and the policy makers, and he encourages collective action and global collaboration. He also evokes responsibility by means of a 'legacy frame'. The scientific information he presents is in 'non-technical' language and it expresses warnings. By means of volition, Gore expresses urgency and places responsibility. He particularly emphasises the need for the audience to see that immediate collective action is necessary. Gore uses a more personal communicative style by including personal pronouns (*I*, *we*, *us*), reflexive pronouns (*ourselves*) and possessive pronouns (*my*).

4.4. Hypothetical meaning

I mentioned in chapter 2 that hypothetical meaning can be expressed through the 'past form' of the MAs. Evident from tables 4.8 and 4.9 (below) is that *would* is the MA most commonly used to express hypothetical prediction in both texts. *Could* is also relatively frequent in the P-text. Of the different strategies for expressing hypothetical meaning, the speakers' use of *would* and *could* reflects the greatest discrepancy. These modals seem to be preferred by Pachauri. With the *if*-clauses and implicit *if*-clauses, the discrepancy between the speakers is small. However, table 4.1 illustrates the difference between the texts regarding how many of the examples from each text that express some kind of hypothetical meaning, this was almost 45% of the examples from the P-text.

4.4.1 Hypothetical meaning in the G-text

Table 4.8: Hypothetical meanings in the G-text

Meaning → **expression↓**	**Hypothetical Meaning** **No.**	**Hypothetical prediction** **No.**	**Hypothetical possibility** **No.**
Would	-	5	
Could	-		1
If-clause	6		
Implicit *if*-clause	7		
Total	**13**	**5**	**1**

Example (29) illustrates how far Gore goes to explain in familiar terms the complexities of the greenhouse effect. The whole if-clause constitutes this explanation:

(29) Now science is warning us that **if** we do not quickly reduce the global warming pollution that is trapping so much of the heat our planet normally radiates back out of the atmosphere, we are in danger of creating a permanent "carbon summer." (G, 24)

Example (29) is an example of hypothetical meaning expressed through an explicit *if*-clause (section 2.4.3, above). The *if*-clause, or the protasis, predicts the apodosis, *we are in danger* (…) *"carbon summer"*, if the protasis is true and (not) fulfilled. The example constitutes a clear warning. The information is not precise in scientific terms, compared to Pachauri's presentation of scientific information, and this might provide a more effective warning. By reference to *science,* the speaker attributes the information to an unspecified 'someone' who knows this.

Example (30) below is intended to encourage the audience:

(30) But there is hopeful news as well: we have the ability to solve this crisis and avoid the worst - though not all - of its consequences, **if** we act boldly, decisively and quickly. (G, 8)

Here, the extract is used to convince the audience that it is not too late to act, and; **if** they behave as the speaker suggests, they can solve the *crisis*.

Example (31) illustrates an implicit *if*-clause (section 2.4.4 above):

(31) And **when** large truths are genuinely inconvenient, whole societies can, at least for a time, ignore them. (G, 20)

When implies *if*, and this subordinate clause implies the condition *if a truth is inconvenient, then…*, ('if *p* then *q*'). Therefore, like in ex. (29) and ex. (30), there is a causal relationship between the clauses in ex. (31). Semantically, ex. (31) functions as a kind of excuse for

human behaviour. Pragmatically, it is likely intended to cause a reaction; to cause people to change and to face the truth (cf. section 5.3).

Example (32) is another example of an implied *if*-clause – *if we face and remove the danger…*:

(32) By facing and removing the danger of the climate crisis, we have the opportunity to gain the moral authority and vision to vastly increase our own capacity to solve other crises that have been too long ignored. (G, 41)

This is yet an example of Gore's dialogic style. By means of inclusive *we*, and the point the speaker makes while referring to *our own capacity to solve other crises* Gore creates interaction with the audience.

In its structure and content, ex. (32) has some encouraging, instructional qualities. The speaker suggests that we get over our fears by facing them. This is an appeal to the hearers' sense of responsibility, solidarity and will to take control of the situation ('danger control' is discussed in section 5.3 below). It can also be perceived as an attempt to engage the audience's emotions (pathos) as the speaker mentions *moral authority*.

4.4.2 Hypothetical prediction and possibility in the G-text

The examples that express hypothetical prediction from the G-text frequently express a threat. For instance, in ex. (33) the speaker issues a warning by predicting that it is possible or likely that some consequences will be *unsustainable and unrecoverable*:

(33) The penalties for ignoring this challenge are immense and growing, and at some near point would be unsustainable and unrecoverable. (G, 30)

This use of *would* evokes the future predictive sense of *will*. What ex. (33) indicates is the presence of an omnipresent threat. Something *will* happen in the near future, unless we commit to choosing the preferable path, provided by Gore through this text. The speaker warns us about the assumed consequences if these actions are not taken.

Modality can be expressed several times in a sentence, for added emphasis. The following example includes four MAs. The underlined auxiliaries express hypothetical meaning; the underlined *would* expresses hypothetical prediction, and *could* expresses hypothetical possibility, *might* expresses possibility and *would* (bold) expresses volition (and negative polarity):

(34) These were not comforting and misleading assurances that *the threat* was not *real* or *imminent*; that it would affect others but not ourselves; that ordinary life **might** be lived even in the presence of *extraordinary threat*; that Providence could be trusted to do for us what we **would** not do for ourselves. (G, 28)

In ex. (34), Gore introduces an analogy. The effect of an analogy is to make explicit similarities between two things. This text extract functions as a subtle suggestion to act, and as a warning. Emotional emphasis is added as the speaker refers to the situation as *the threat*, and by modifying it on a later occasion with the adjective *extraordinary* (*threat*).

4.4.3 Hypothetical meaning in the P-text

In contrast with the G-text, where hypothetical meaning was expressed by means of *would* and *could*, the P-text uses three strategies to express hypothetical meaning. Table 4.9 suggests that one is preferred to the other two. Interestingly, the modal idiom BE *to* occurs only in the P-text.

Including all three hypothetical categories, this group constitutes the largest group of examples from the P-text. The MAs also express degrees of extrinsic modality. This is expressed most often through the MA *would*, but also frequently by means of *could* (see further section 4.4.4).

Table 4.9: Hypothetical meanings in the P-text

Meaning → expression↓	**Hypothetical Meaning**	**Hypothetical prediction**	**Hypothetical possibility**
	No.	**No.**	**No.**
Would	-	15	
Could	-		12
BE *to*	3		
If-clause	8		
Implicit *if*-clause	3		
Total	**14**	**15**	**12**

What is evident in the P-text, is that hypothetical meaning is used as a communicative strategy to talk about climate change, global warming, the contributors to these and the consequences they may lead to. I will try to demonstrate this in the ensuing discussion.

Were to, followed by the infinitive, is a way of expressing an unreal future condition in a formal context. This strategy for expressing hypothetical meaning does only occur in the P-text an it implies an overtone of tentativeness, since *were to* evokes a strong sense of doubt (see section 2.4.2):

(35) These changes, **if** they <u>were to</u> occur would have serious effects on the sustainability of several ecosystems and the services they provide to human society. (P, 12)

The truth of the proposition *these changes would have serious effects on (…) human society* depends on the truth of the condition in the protasis *if they were to occur*. This clause structure results in a relatively strong sense of tentativeness towards the contents of the proposition.

Example (35) provides a tentative assessment, but it also implies a stronger evaluation. *Serious effects* can be said to express a warning, and *several ecosystems* and *human society* are presented as being vulnerable to these *effects*. The fact that Pachauri explicitly hedges his proposition in the protasis, gives a hint of the restrictions that apply to his position as chair of the IPCC. The communicative style Pachauri uses is typical for the communication of science, and by extension, probably also for the discourse of climate change (cf. Halliday 1993; Sterman and Sweeney 2007; Maibach et al. 2008).

Example (36) is an interesting example from the P-text:

(36) We, therefore, have a short window of time to bring about a reduction in global emissions **<u>if</u>** <u>we wish to limit temperature increase to around 2 °C at equilibrium</u>. (P, 24)

This short extract contains two personal pronouns (*we*) and a metaphor (*a short window of time*) (see further section 5.5.1). The *we*'s in ex. (36) has an inclusive element, and they target both the general public and the decision makers. The extract constitutes a warning, and a careful expression of hope, as the speaker suggests that there is still a bit of time left to do something.

The following two examples are occurrences of implicit *if*-clauses in the P-text. The underlined text in ex. (37) and ex. (38) imply the *if*-clause, or the protasis, in a clause complex. The MA *could* in ex. (37) hedges the information in the protasis:

(37) <u>Neglect in protecting our heritage of natural resources</u> could prove extremely harmful for the human race and for all species that share common space on planet earth. (P, 6)

The underlined clause in ex. (37) constitute an information heavy Subject. In ex. (37), the P-text signals its origin in a scientific context, as the process (underlined in the example) is presented as a participant through a noun phrase (cf. grammatical metaphor in section 2.3.5).

In ex. (38), the whole clause functions as a fronted disjunct:

(38) Where extreme weather events become more intense or more frequent with climate change, the economic and social costs of those events will increase. (P, 13)

Emphasis is added by *extremely harmful* in ex (37) above, and the disjunct in ex (38) includes some serious consequences. This suggests that both examples are warning assessments of potential negative global consequences.

4.4.4 Hypothetical prediction and hypothetical possibility in the P-text

Prediction and hypothetical meaning both represent degrees of uncertainty in ex. (39):

(39) -For a CO2-equivalent concentration at stabilization of 445-490 ppm, CO2 emissions would need to peak during the period 2000-15 and decline thereafter. (P, 24)

In ex. (39), there is no protasis, that is, the future condition is expressed implicitly. The speaker here presents the technicalities behind the stabilisation of greenhouse gases (CO_2) in the atmosphere (cf. section 3.1), which is quite complex. This extract illustrates perfectly what Sterman and Booth Sweeney (2007) meant when they said that information about climate change is technical, and difficult to understand for non-scientists. There are some complex technical terms in this extract and in order to comprehend fully the extension of what Pachauri is saying in this example, it is necessary to understand these (cf. Halliday 1993). Some examples are *a CO2-equivalent concentration* and *stabilization of 445-490 ppm.*

The speech function in ex. (39) is that of a proposition exchanging information, but there is a hint of a suggestion implied, a subtle encouragement to make the proposition possible. There is also a sense of the speaker judging the necessity of how important it is for this (for CO_2 emissions to peek during the period 2000-15) to happen.

Both ex. (39) and ex. (40), below, fit into the group of 'fuzzy' examples that express degrees of prediction, in addition to hypothetical meaning (cf. section 2.5). In ex. (40), the speaker predicts what the requirement for *a rational approach* is, and the rational approach is presented as a hypothetical option:

(40) A rational approach to management of risk would require that human society evaluates the impacts of climate change inherent in a business-as-usual scenario and the quantifiable costs as well as unquantifiable damages associated with it, against the cost of action. (P, 25)

The information Pachauri gives in ex. (41) below relates to possible consequences of climate change. This information is based on the findings provided by the IPCC and presented in the Fourth Assessment Report. Again, the language is technical:

(41) By 2020, in some African countries, yields from rain-fed agriculture could be reduced by up to 50%. (P, 10)

The modal meaning attached to *could* in ex. (41) is one of tentative possibility. This seems less certain than *will* would have in the same context, and gives a sense of tentativeness towards the proposition. This use of *could* is also close to prediction, as the speaker seems to express his, or the IPCC's view that *it is predicted that yields could be reduced* (…).

Example (42) sums up, in simple terms, the work of the IPCC:

(42) How climate change will affect peace is for others to determine, but we have provided scientific assessment of what could become a basis for conflict. (P, 32)

Example (42) is an illustration of hypothetical meaning, expressing possibility (cf. section 2.5). The essence of ex. (42) is to create a link between the work of the IPCC and potential conflict.

4.4.5 Observations on hypothetical meaning; prediction, and possibility

The examples that express some type of hypothetical meaning comprise approximately 45% of the examples from Pachauri's text and approximately 22% of the examples from Gore's text. Pachauri applies all of the four different categories for expressing hypothetical meaning (see section 2.4), whereas the modal idiom does not occur in the G-text. There are more examples that also express degrees of possibility and prediction in the P-text than in the G-text. This follows the pattern from section 4.3 where Pachauri used prediction more often than Gore did.

The context in which these meanings occur varies in the two texts. In his speech, Gore appeals to the audience's sense of fear, he also tries to encourage them. Also in the above examples does Gore ask the audience to take responsibility. The speaker mentions *moral authority* in an attempt at engaging the audience's emotions (pathos). I suggested that Gore goes a long way to present complex information in a more comprehensible manner. This is a good idea to make sure that the audience perceives the threatening messages. Also evident in these examples is Gore's personal interactional communicative style in his use of personal pronouns. Again, this illustrates Gore's personal commitment, and his interactional style.

Pachauri is concerned with the impacts of climate change, linking the work of the IPCC to peace and conflict, and the economic aspect of the issue (ex. (40)). The scientific assessments

and predicted impacts Pachauri presents function as warnings, but they are hedged. In addition, the technical, scientific terms may affect comprehension.

There are occurrences of the inclusive *we* also in the P-text, but they are not as frequent as in the G-text. By means of *we* the speaker targets both the general public and the policy makers (ex. (42)). This particular example conveys a warning and an encouragement, since Pachauri suggest that if we start acting now, we still have some time to limit the projected impacts.

4.5 Necessity and obligation

Necessity expressed through *must* conveys that the speaker judges the proposition to be necessarily true. HAVE *to*, unlike *must*, does not delegate authority to the speaker, rather "the authority comes from no particular source" (Coates 1983: 55).

Obligation suggests that the speaker is promoting a certain form of behaviour. This is expressed by means of *should* and *must* in the data. When obligation is expressed by *must*, the MA implies that the speaker uses his authority. When, in turn, obligation is expressed by *should*, the MA does not suggest that the speaker is confident that the advice or recommendation will be exercised.

4.5.1 A distinct feature in the G-text

The expression of necessity and obligation revealed a notable strategy in the G-text. One interesting point is that all of the examples express some type of advice, except for two, which can arguably be said to express encouragements, but also implicit advice (section 4.5.2).

Table 4.10: Necessity-necessity ↔ obligation-obligation in the G-text

Modal meaning→	**Extrinsic ←----------→ Intrinsic**		
	Necessity	**Nec ↔oblig.**	**Obligation**
Modal expression↓	**No.**	**No.**	**No.**
Must	2	9	-
Need/ to	5	1	-
Should	1	1	2
Have to	1		-
Total	**9**	**11**	**2**

Table 4.10 illustrates the modal expressions; both *must* and *need to* express high value of modality, whereas *should* expresses median modality (see table 2.3, above).

Must expresses high value modality, which, in this context, implies a strong sense of necessity (extrinsic) *and*/or obligation (intrinsic). The difference between the categories in table 4.10 is

that the advice and suggestions are expressed a little less demanding in the categories of necessity and obligation in particular, than in the intermediate group.

To illustrate the different categories the three examples below express necessity (ex. (43)), obligation (ex. (44)), and necessity ↔ obligation (ex. (45)):

(43) The pace of our response must be accelerated to match the accelerating pace of the crisis itself. (G, 44)

(44) Heads of state should meet early next year to review what was accomplished in Bali and take personal responsibility for addressing this crisis. (G, 45)

(45) We must understand the connections between the climate crisis and the afflictions of poverty, hunger, HIV-Aids and other pandemics. (G 42)

In ex. (45) *must* implies obligation in that the speaker is trying to exert his control as a communicator of this message, and he can thus increase understanding by emphasising a link some recipients may not be aware of. *Must* also expresses necessity, in that the speaker expresses that he thinks is necessary that *we* understand.

4.5.2 Choice of Subject

One thing to notice from these examples is that there is a significant difference in choice of Subject (section 2.2.1.1). This is elaborated upon in the following sections. Here, I suggest that the choice of Subject affects the modal meaning attached to the MA (cf. ex. (43) and ex. (45)), and that the choice of Subject influence the choice of MA (cf. ex. (44)). *Must* in ex. (43) does not express the additional sense of obligation that it does in ex. (45), and this has to do with the choice of Subject in the Mood.

The Subject in ex. (43) – *The pace of our response* – does not implicate the sense of obligation that *We* (Subject) does in ex. (45). In ex. (45), *we* is both Subject and Actor, thus responsibility can be assigned to a known Subject. In comparison, the Subject in ex. (43) is not also the Actor, therefore it does not immediately evoke the possibility of being a responsible Subject, even if *our* in *our response* presumably implies the same *we* as in ex. (45). The MA *must* suggests the speaker's confidence in the propositions in both ex. (43) and ex. (45).

The Subject in ex. (44) – *Heads of state* – produces a different auxiliary than ex. (43) and ex. (45) (cf. also the use of *should* in ex. (31), section 2.5 above). *Should* does not entail that the speaker thinks the *Heads of state* will follow his suggestion.

The MA *should* expresses median degree of modality, whereas both *need* (when it functions as a MA) and *must* express high modal value. This is interesting when considering the choice of Subject. When advice and suggestions are expressed, by Gore, through the modal meanings of necessity or obligation, and the Subject implies governments or state leaders, the MA *should* fills the Finite slot, and the modal value is then median. Still noticeable, but less strong and demanding, than *must*, *ought to* and *need*.

4.5.3 Necessity in the G-text

In ex. (43) above, the speaker expresses judgment of the necessity for *the pace of our response to be accelerated…*in order to *match the accelerating pace*…. The gist of ex. (43) can be said to indicate the speaker's assessment of how likely, important, and necessary it is that *we* act (or; *accelerate*). The example expresses this in very simple terms.

All of the occurrences of necessity in the G-text express some kind of advice, and the necessity involves the speaker's judgment of how likely the proposition is. The following example expresses an additional sense of encouragement:

(46) But neither need be our fate. (G, 26)

The essence of ex. (46), though implicitly expressing advice, is that it is encouraging. Gore conveys that he thinks it is likely that *our fate* can be different. Example (46) indicates a few grains of hope in this larger context of threats, warnings, and advice.

The Subjects chosen in the examples expressing necessity are of different kinds. *We* is used three times, which includes the speaker in the Subject (e.g. ex. (47)). This example evokes the speech roles of demander *and* giver for the speaker and the role of 'giver' for the recipients (section 2.2.2 above):

(47) **We** also need a moratorium on the construction of any new generating facility that burns coal without the capacity to safely trap and store carbon dioxide. (G, 46)

Need in ex. (47) expresses extrinsic meaning, which means that the modal meaning conveys the speaker's assessment of what he deems is a likely strategy.

(48) **This treaty** should be ratified and brought into effect everywhere in the world by the beginning of 2010 - two years sooner than presently contemplated. (G, 44)

The Subject in ex. (48) illustrates another type of Subject among these examples; the starting point, or the focus, becomes *the treaty*. By means of the MA *should*, the proposition in ex.

(48) is presented as a suggestion. The extrinsic meaning of *should* means that Gore is tentative as to whether he thinks the decision makers will actually follow his suggestion. Both of these examples explains in simple terms what the speaker sees as necessary, and targets both the general public and the decision makers.

In ex. (49) below, the pronoun *we* is followed by the semi-auxiliary *have to*, which is similar to *must* in meaning, except that it expresses a stronger sense of necessity than does *must* (cf. Quirk et al. 1985):

(49) That is just another way of saying that we have to expand the boundaries of what is possible. (G 53)

4.5.4 Necessity ↔ obligation in the G-text

The main choice of Subject in the intermediate category is the inclusive *we*. This pronoun occurs in the Subject position 6 times, and it is most often followed by *must* (table 4.11). All the occurrences of advice expressed in a similar fashion as ex. (45) above imply both a necessity reading and an obligation reading:

Table 4.11 (Extracts, see App. 2): Examples with *we* + *must* expressing necessity ↔ obligation in the G-text

1) (G, 27)	**We** must quickly mobilize our civilization with the urgency and resolve that has previously been seen only when nations mobilized for war.
2) (G, 37)	**We** must ensure that entrepreneurs and inventors everywhere on the globe have the chance to change the world.
3) (G, 35)	**We** must abandon the conceit that individual, isolated, private actions are the answer.
4) (G, 42)	**We** must begin by making the common rescue of the global environment the central organizing principle of the world community.

In addition to considering how *we* functions in this context, it is also interesting to consider the verbs that are used here; *mobilize*, *ensure*, *abandon*, *begin*. They all imply some kind of movement, responsibility, action, or change.

In all the above examples from the intermediate group (ex. (45) and table 4.11, cf. also App. 2) Gore uses *we* and thus includes him *and* the audience as 'givers' or 'doers'. Simultaneously, he adopts the role of 'demander', similar to ex. (48) above (cf. the presentation in section 2.2.1.1). Thus, the examples constitute request-like propositions. This creates the opportunity for the speaker *not* to be perceived as an authority. Even though the speaker has the role of 'demander', he includes himself on the receiving end, and can thus be

considered as a 'co-giver/doer'. The frequent use of a personal pronoun again illustrates the communicative strategy applied by the speaker, which reflects an explicit personal involvement and commitment. In addition, the language is simple, and consequently easy to understand.

4.5.5 Obligation in the G-text

There are just two examples in the G-text that express obligation only (see example (44) above). In both examples *should* is used to express obligation:

(50) No one should believe a solution will be found without effort, without cost, without change. (G, 51)

4.5.6 Necessity in the P-text

A quick glance at tables 4.10 and 4.12 illustrate that the speakers actually use quite similar strategies for expressing the modal meanings, except that Pachauri includes fewer 'fuzzy' examples.

Table 4.12: Necessity and obligation in the P-text

Modal meaning→	**Extrinsic ←→ Intrinsic**	
	Necessity	**Obligation**
Modal expression↓	**No.**	**No.**
Must	2	1
Need/ to	1	-
Modal disjuncts	1	-
Total	**4**	**1**

Must expressing necessity conveys the speaker's judgment of the proposition as being necessarily true. Both ex. (51) and ex. (52) may provide the paraphrases; *I think it is imperative that (…)* (strong obligation), or; *I think it is important that (…)* (weaker obligation). Thus, implicitly Pachauri presents his personal views on the matter, and he also encourages his audience to adopt the same view. However, the speaker expresses no overt authority:

(51) Coming as I do from India, a land which gave birth to civilization in ancient times and where much of the earlier tradition and wisdom guides actions even in modern times, the philosophy of "Vasudhaiva Kutumbakam", which means the whole universe is one family, must dominate global efforts to protect the global commons. (P, 5)

(52) These three realities encircle an important truth that must guide global action involving the entire human race in the future. (P, 5)

The examples expressing necessity in the P-text also convey the speaker's ideology (see also ex. (14) in 4.2.3 above). Examples (51) and (52) explain in (quite) simple terms the necessary ideology that should guide our actions. Through the above examples, the speaker invokes a 'global collaboration' frame. In example (51), it takes a little while for the speaker to 'get to the point'. The speaker's involvement, however, is not made explicit for the hearers in ex. (51) and ex. (52). Yet, by being the speaker, Pachauri renders possible the assumption that he *does* believe in the propositions in the above examples.

In ex. (53) below the marginal modal *need to* expresses extrinsic necessity. *Need to* here resembles *must* in meaning (the MA *would* expresses hypothetical meaning). It expresses the speaker's judgment of the necessity for CO_2 emissions to peak during a mentioned timeframe in order to be stabilised at a certain level. Thus, a suggestion or advice is implied:

(53) For a CO2-equivalent concentration at stabilization of 445-490 ppm, CO2 emissions would need to peak during the period 2000-15 and decline thereafter. (P, 24)

The language in ex. (53) is again quite technical, and understanding probably requires familiarity with at least some of these terms. Particularly considering how the text is a presented as a spoken presentation.

In ex. (54), the advice is very subtle, and the target audience is explicitly mentioned:

(54) Several parts of our reports have much information and knowledge that would be of considerable value for individual researchers and think tanks dealing with security issues as well as governments that necessarily are concerned with some of these matters. (P, 7)

The disjunct *necessarily* is not attached to the implied suggestion that *individual researchers and think tanks* and *governments* should consider the IPCC report. Rather, *necessarily* is attached to the nature of governmental business. That is, governments are, by definition (and necessity) concerned with matters related to state security, among other things. However, the target audience of this particular extract are in fact *researchers*, *think tanks*, and *governments*.

4.5.7 Obligation in the P-text

The single example that expresses obligation in the P-text is presented here:

(55) The Fourth Assessment Report of the IPCC has had a major impact in creating public awareness on various aspects of climate change, and the three Working Group reports as part of this assessment represent a major advance in scientific knowledge, for which I must acknowledge the remarkable leadership of the Co-Chairs of the three Working Groups (…) (P, 2)

The speech function of ex. (55) is an offer to do something. It is a self-imposed obligation. Here, Pachauri calls attention to his own sense of duty, and expresses his respect for the Co-Chairs at the IPCC and their work.

4.5.8 Observations on necessity and obligation

Both speakers use *must* and *need to* to express necessity, in addition, Gore uses *should*, and Pachauri uses a modal disjunct. Obligation is not frequent in the P-text; Pachauri uses *must* only once to express this. Gore, however, uses *must*, *need to*, *should,* and *have to* to express both necessity *and* obligation, but *should* occurs just twice to express obligation only.

In total, when combining these three groups, this category constitutes almost 26% of all the examples from the G-text. By contrast, they constitute only approximately 6% of the examples from the P-text. This and the differences that were revealed in the discussions on prediction (section 4.3*ff*) and hypothetical meanings (section 4.4*ff*) above constitute the main differences between the texts in terms of the attitudes the speakers convey towards their propositions. In addition, it suggests that the overall 'modal impact' of the two texts is very different. In terms of rhetorical function, Pachauri reveals an informative, or expository, text, and Gore presents a more persuasive text (see section 1.5.3 above).

Gore's communicative style reflects a personal involvement, and he has adopted a more interactional and inclusive strategy. This is illustrated clearly in Gore's use of the personal pronoun *we* in the above examples. The relationship between the Subject and the modal auxiliary revealed an interesting feature in Gore's way of uttering advice. *Must*, which involves the speaker expressing his authority, usually followed *we* when this functioned as Subject. *We* includes both Gore and his audience, so the effect is a series of command-like demands where the speaker does not appear as an authority. *Should*, which is less demanding and does not express the speaker's authority, followed the Subject on a few occasions when the Subject implied governments or state leaders.

This inclusive and interactional strategy is not present at all in the P-text. However, one instance of personal involvement is evident in the P-text where the speaker expresses his sense of duty and honours the Co-Chairs for their effort. In addition, Pachauri expresses his personal opinion about the ideologies that should underlie future actions. As such, the speaker presents a 'global collaboration' frame (cf. ex (51)).

One similar feature in all the above examples is that almost all of them express some type of advice. However, how they are expressed reveals a significant discrepancy between the two speakers. Whereas Gore is explicit in his advice giving, Pachauri is careful and tentative. This again illustrates the different communicative strategies adopted by the speakers.

4.6 Permission

4.6.1 Permission in the P-text

When the MA *can* expresses permission, it is possible to substitute the MA by the paraphrase *be allowed to*. Permission does not occur in the G-text at all and only once in the P-text:

(56) Hazards from the impacts of climate change are, therefore, a reality today in some parts of the world, and we cannot hide under global averages and the ability of affluent societies to deal with climate-related threats as opposed to the condition of vulnerable communities in poor regions of the globe. (P, 28)

Cannot in ex. (56) expresses the speaker's opinion. Implicitly there is a sense of permission, or a 'negative' advice, concerning something *we* should not be allowed to do under the circumstances. The use of *hide* emphasises the notion that this is not the desired behaviour, and the whole extract functions as a warning.

4.6.2 Observations on permission

The fact that permission is so rare – it does not occur in the G-text at all – may be because the speakers do not focus on what individual groups or governments should, or should not be 'allowed to do'. Rather, Pachauri is focused on presenting the information collected in the Fourth Assessment Report (cf. section 4.5.8). Gore is focused on his communicative goal (*we must act*), and he attempts to reach it by evoking senses of necessity and obligation, rather than permission (again, cf. section 4.5.8).

4.7 Usuality

In both texts, usuality is expressed exclusively by modal disjuncts. Of the disjuncts that appear, only *often* occurs in both texts (tables 4.13 and 4.14). In both texts, there are instances of two disjuncts in the same clause complex (e.g. ex. (57), ex. (59), and ex. (60)).

4.7.1 Usuality in the G-text

Table 4.13: Usuality in the G-text

Modal: meaning → expression ↓	**Usuality**
Sometimes	1
Never	2
Normally	1
Often	2
Always	1
Total	**7**

An interesting point about the disjunct *never* is the negative polarity and the context in which it appears. In ex. (57), (also presented as ex. (23) in section 4.3.2), this negative polarity refers to what *we* and *Alfred Nobel* did not 'intend to do':

(57) We never intended to cause all this destruction, just as Alfred Nobel never intended that dynamite be used for waging war. (G, 16)

I suggested in section 4.3.2 that ex. (23) could be seen as an excuse for human behaviour. I add here that the speaker does this by suggesting that bad things can happen unintentionally. Again, the speaker presents an analogy, and creates a link between two events (cf. ex. (34) in section 4.4.2).

Normally in ex. (58) below refers to the earth's normal process of absorbing and reflecting solar energy:

(58) Now science is warning us that if we do not quickly reduce the global warming pollution that is trapping so much of the heat our planet normally radiates back out of the atmosphere, we are in danger of creating a permanent "carbon summer". (G, 24)

The use of *normally* here implies that this might not go on 'continuing as normal'. This implication is reinforced by the included metaphor *"carbon summer"* (see ex. (27) in section 5.5). The gist is that CO_2 emissions will interrupt the (normal) balance of absorption and reflection of heat, and as a result, we will have global warming. The long *if*-clause was commented upon in section 4.4.1 above.

It is interesting that the speaker does not provide a source to support this statement. The general reference to *science* makes it difficult to contest. The proposition in ex. (58) above is not indisputable, but the speaker presents the information as a shared assumption. In addition, the focus is on the information in the proposition, the *warning*, rather than the science.

In ex. (59) Gore invites his parents "on stage":

(59) My parents spoke often of Hull, always in tones of reverence and admiration. (G, 40)

This is a rhetorical strategy which is meant to improve the speaker's ethos (section 1.6). Now, Gore receives the same prize as Hull, whom he presents as an honourable person. By extension, Gore should share these feelings of reverence and admiration from his parents, since he now has won the same award.

4.7.2 Usuality in the P-text

Usuality is not very frequent in the P-text. It constitutes approximately 4% of the examples from the text. All the disjuncts occur in the technical sections presentation in the P-text (cf. section 4.3.3).

Table 4.14: Usuality in the P-text

Modal: meaning → expression ↓	**Usuality**
Usually	1
Often	2
Seldom	1
Total	**4**

Example (60) expresses degrees of usuality twice in the same clause:

(60) Migration, usually temporary and often from rural to urban areas, is a common response to calamities such as floods and famines. (P, 17)

The first time, *usually* refers to what happens on most occasions. That is, normal behaviour for *migration* is that it is of temporary duration. The second time, *often* refers to where the migration patterns runs on most occasions. In this case, *migration* moves from rural to urban areas on most/many occasions.

Example (61) is interesting because it presents the possibility for *novel risks*:

(61) But climate change poses novel risks often outside the range of experience, such as impacts related to drought, heat waves, accelerated glacier retreat, and hurricane intensity. (P, 21)

The speaker issues a warning that the consequences we may encounter are beyond what we have experienced so far; they may be much worse. In terms of technical language, *glacier retreat* and *hurricane intensity* are two examples.

Example (62) is interesting because of *seldom* and the conjunction *but*, which presents contrast:

(62) Adaptation measures essential to reduce such vulnerability, are seldom undertaken in response to climate change alone **but** can be integrated within, for example, water resource management, coastal defence, and risk-reduction strategies. (P, 21)

The gist is that *adaptation measures* should be considered, and integrated into other strategies. Thus, the speaker is presenting a possible strategy (cf. efficacy-information in section 5.3).

4.7.3 Observations on usuality

From the above examples, it can be noted that usuality in the P-text occurs in the context of potential impacts of climate change, and also when Pachauri debates relevant adaptation measures (e.g. ex. (62)). By contrast, in the G-text, only ex. (58) is in the field of climate change. Examples (58), (60), and (61) all contain some information that has the potential to induce fear in the audience (see pathos in section 1.6; see also further chapter 5). Particularly Gore's extract in ex. (58) is an explicit warning of the possible dire future we will experience, if we do not reduce the emission of greenhouse gases.

4.8 Concluding remarks

Two noticeable features in particular were revealed through this analysis. First, Gore's strategy expressed through necessity and obligation (section 4.5.1*ff*), which communicates urgency and demands, comprises an important part of his communicative strategy. Second, Pachauri's communicative style, which was discussed in the presentation of prediction (section 4.3.3). The stylistic effect of these modal metaphors in Pachauri's text gives an impersonal way of communicating information, where it is sometimes hard to unveil a responsible Subject.

Having stated the speakers' communicative goals in chapter 1, the above discussion has illustrated that the speakers have applied rather different communicative strategies. Chapter 3 presented two studies, which suggest that communication of climate change is important to increase public understanding, as this may lead to public support for adaptation measures and emission policies. This chapter has revealed that the speakers use different terminology to explain the complexities of climate change, but that they both target the policy makers and the general public.

Pachauri presents an expository text (see chapter 1), and the focus is on the impacts of climate change. He includes technical terminology, which demands a high level of familiarity with the subject matter. Pachauri's text is scientifically more precise and detailed than Gore's, and it does convey some serious warnings. Unfortunately, these may not always be easy to perceive, but the speaker does signal the seriousness of the issue (e.g. ex. (56) in section 4.6.1). Pachauri is also concerned with how we should meet these impacts. For example, he includes a reference to the Indian philosophy "Vasudhaiva Kutumbakam" to emphasise the importance of global collaboration.

Gore addresses the audience directly, and attempts to include them by means of using inclusive *we*, and simple explanations. This strategy makes a proposition come across as less demanding, and the speaker's authority is softened. Success in reaching the general public will increase their understanding of the subject and thus, the need to act. Gore's text has a persuasive rhetorical function. The modality analysis also demonstrated that Gore is concerned with responsibility. Particularly the section on obligation and necessity illustrated how Gore hammers his message into the audience and guides them along to come around and agree with his main objective: *we must act*. Gore focuses largely on gaining support for global action, and he, like Pachauri, applies a 'global collaboration frame'. He does this by appealing to the audience's sense of moral and global responsibilities. He reminds the audience of their responsibilities for future generations, and when he does this, he invokes a 'legacy frame'. Gore also includes one analogy to evoke similarities to the Second World War. The point is to imply how bad the future could be by comparing the present to the past.

Some features that may affect the use of modality were briefly introduced in chapter 1. Since Pachauri receives the Peace Prize as a representative of the IPCC, he speaks on behalf of the Panel. That is, as chair of the IPCC he represents the voice of the IPCC. By contrast, Gore speaks on behalf of himself, which allows him to be more overt. In chapter 5, I will pursue further the overarching aims of this study, by focusing on the message factors in the texts. Thus, the focus turns from the clause as exchange to language as exchange.

5: Message Factors

5.1 Introduction

This chapter will explore further the interaction between speakers and audience (cf. chapter 4), by focusing on the *message factors*. The message factors are concerned with the message structure, how the message is prepared and organised; the message content, appeals and arguments; and language, which includes speed of speech, powerless versus powerful language and intense language (cf. Richard M. Perloff 2003: 176*ff*). The first message factor is not considered in this paper. The message factors that will be considered are 'evidence' (section 5.2), 'fear appeals' (section 5.3), and 'language intensity' (section 5.5). Evidence and fear appeals are part of the message content, and language intensity has to do with the message or language form. Of the elements Perloff (2003) includes as intense language - metaphors, strong and vivid language, and emotionally charged words – section 5.5 will focus on metaphors.

As mentioned in chapter 3, language can be used to educate people about the climate change, increase their awareness, and to create support about adaptation measures and mitigation policies (Sterman and Booth Sweeney 2007; Maibach et al. 2008). Chapter 4 introduced some of the strategies the speakers have adopted to communicate their communicative goals. For instance, Gore frequently expresses urgency to act, and Pachauri presents several probable and predicted scenarios. I suggested that Gore is more explicit in, and personally involved in, his warnings and requests for action than Pachauri is. I also suggested that Pachauri's text contains serious warnings about the predicted impacts of climate change, but that these may be harder to perceive. His text does also come across as more impersonal.

The message factors play a part in portraying the relationship between speaker and recipient. They contribute as logical arguments, as emotional appeals, as creative metaphors, or as strong and vivid language. The message factors connect to the metafunctions within SFL, and in particular, they contribute to the interpersonal metafunction. In other words, the message factors reflect the speakers' stance, their attitudes towards the topic and the audience, and they evoke emotions.

Moreover, evidence is connected to logos, which structures arguments. Fear appeals and intense language has to do with pathos, which arouses emotional engagement. In addition, all the message factors contribute to the shaping of the speaker's ethos. Ethos and pathos are perhaps most interesting in terms of the interaction between speaker and recipient, as these concepts concern e.g. speaker credibility and the hearer's emotions (cf. section 1.6 above). Speaker credibility can be achieved in different ways. A credible speaker is one that is perceived as having expertise, trustworthiness, goodwill, dynamism, extroversion, sociability, and composure (Perloff 2003: 160).

Perloff's (2003) study is a consideration of the persuasive effects of messages. He suggests that the three message factors contribute to a better understanding of the persuasive effects of messages. This chapter will not attempt to explain any persuasive effects of the messages in the two texts, but rather consider some of the evidence, fear appeals, and metaphors that are evident, and discuss the potential effects they contribute to the texts. The remainder of this chapter presents the theory and the following discussion in four parts: Evidence (Section 5.2); fear appeals (section 5.3); the sources (section 5.4); and metaphors (section 5.5). This chapter does not attempt to give an exhaustive presentation of all the message factors in the data, but to illustrate some interesting features from the two texts.

5.2 Evidence

By using evidence, a speaker will necessarily influence attitudes or increase his credibility, because evidence "enhances persuasion", especially when the evidence comes from "a highly credible source" (Perloff 2003: 184, 181). One definition of evidence is that they are:

> *factual statements originating from a source other than the speaker, objects not created by the speaker, and opinions of persons other than the speaker that are offered in support of the speaker's claims* (Mc Croskey 1969: 170; in Perloff 2003: 180).

Perloff (2003: 180) suggests that evidence consists of:

- Factual assertions
- Quantitative information (statistics etc.)
- Eyewitness statements
- Narrative reports
- Testimonials, or opinions advanced by others

Vivid case stories and narrative evidence engage the hearer's imagination, as they are "emotionally engaging stories of one particular person's experiences with a problem in life" (ibid: 182).

Some scholars think that narrative evidence is more compelling than statistics when it comes to persuasion. They suggest that vivid stories evoke stronger mental images, which are easy to access from memory, than abstractly presented information, like percentages and statistics. In this view, narrative evidence is more likely to influence attitudes (Rook 1987; in Perloff 2003: 183).

Other scholars suggest that vivid stories can be too distracting, that they interfere with reception of the message, with the result that people fail to process the arguments (Frey & Eagly 1993; in Perloff 2003: 184). Still other scholars suggest that the most compelling evidence depends on the persuader's purpose:

> *Narratives may be more effective when communicators are trying to shake up people who strongly disagree with the message; statistics carry more weight when persuaders are trying to influence cognitions or beliefs* (Slater & Rouner 1996; Kopfman et al. 1998; in Perloff 2003: 184).

Narratives engage the hearers and can be more interesting than statistics because they engage the imagination, but statistics may evoke the idea that "an argument backed by numbers is probably correct" (Perloff 2003: 184). Numbers and percentages give the recipient an idea of how big or small a problem is. Thus, both narratives and statistics can influence attitudes:

(1) In the camps, people are dying slowly. 2.5 million people dying slowly; 5,000 people dying each month and the world is ignoring that. These people need to be recognised, the crimes have to be recognised, because right now, when you read the news, they talk about what happened in 2004, not what happens today (Moreno-Ocampo 2009).

In this extract, numbers are used as evidence to portray the situation for people in Sudan's IDP camps (Internally Displaced Persons). The numbers emphasise the vastness of the humanitarian crisis that is happening, and creates a basis for comparison. The numbers help us put things in perspective and appeal to our understanding of proportions, whereas a photo of a few individuals or an eyewitness statement appeals to our compassion.

In summary, Perloff mentions that evidence can be seen as rational or emotional, and that people are more easily influenced by "concrete, emotionally interesting information", than by dry statistical data (2003: 182). However, he suggests that rational dry statistics, which presents percentages of how many people die of hunger every year, can evoke emotions that change people's attitudes and have them donate money to foreign aid on the spot. That is why Perloff argues that it is too simple to classify message content factors as being either rational or emotional; it is also a matter of how people respond to them.

The present study notes the point Perloff (2003) makes about rational vs. emotional evidence, that this is a too simple distinction between types of evidence, but for simplicity's sake, this distinction is applied in the ensuing discussion.

5.2.1 Discussion of evidence in the data

The focus of the following discussion is on evidence – chunks of texts signalled by quotation marks ("...") – which falls into one of the five categories on the list above. These are particular points in the texts where it becomes clear that the speakers in some way emphasise a specific bit of text, and that these text extracts can be seen (in context) as supporting the speaker's claim or opinions. This paper suggests that the speaker's choice of 'additional sources' can also be considered as a strategy for borrowing authority.

What will become clear from this presentation is that some quotes are for instance used to pay respect to the Norwegian audience. When the name of a cited author appears in the citing sentence, this is called 'integral citation' (Hyland 1999: 344).

There are no occurrences of quantitative evidence in the two texts. Both speakers have used quotes that function as 'opinions advanced by others' and 'fear appeals'. In addition, Pachauri has included quotes that function as 'case stories/narratives' and 'factual evidence', and Gore uses projection to invite additional voices into the context (section 5.2.1.1).

5.2.1.1 Evidence in the G-text

Totally, Gore includes 18 chunks of text enclosed by quotation marks. Two of these are metaphors (c.f. ex. (26) and ex. (27), section 5.5), two of these are categorised as fear appeals (section 5.3.1.1), and four are his own words in quotes (cf. 'projection' below). The remaining 10 examples are categorised as 'opinions advanced by others'.

Opinions advanced by others

Borrowing the words of others to express or to support a claim or an idea emphasises that particular claim or idea in the text. In retrospect, people may more easily remember this if it appealed to them somehow. In ex. (2), Gore borrows the words of the Norwegian playwright Henrik Ibsen:

(2) "One of these days, the younger generation will come knocking at my door." (G, 55)

This must have been a conscious decision designed for the Norwegian audience, similar to ex. (12) below, where Pachauri includes the words of Berge Furre. The strategy of including the

words of a famous Norwegian author is likely a pandering to the audience. If successful, it will evoke, in the audience, emotions (pathos) of solidarity and good will towards the speaker.

Gore includes quotes from several authors and poets in his text (such as Antonio Machado and George Orwell, see section 5.4). In ex. (2), Ibsen's words are borrowed to remind us of the responsibility this generation has towards future generations. Maibach et al. (2008) suggest that a perceived threat to future generations can be an incentive to encourage people to change their behaviour (cf. section 3.2).

Below, under 'projection', Gore provides a few examples in which he projects the voice of the 'next generation'. This adds an additional voice into a genre that is monologic by nature (section 1.7 above).

Example (3) below is a contrast between good and bad. Cockroft and Cockroft (1992) call this "the oppositional model" (1992: 66), which functions on the basis of contrast, for instance between 'good' and 'bad' (contraries) or 'good' and 'not good' (contradictions). The words are borrowed from Moses, Book of Deuteronomy, in the Old Testament (verse 30:19) (gotquestions.org):

(3) "Life or death, blessings or curses. Therefore, choose life, that both thou and thy seed may live." (G, 7)

The example emphasises that we can chose between two futures (cf. ex. (1) section 4.2.1). Similar to ex. (2) above, the speaker states in ex. (3) that this generation has a responsibility towards future generations. Both of these examples convey a 'legacy frame'.

Extract (3) presents a choice between life and death. This simple equation is effective if the recipients agree with the speaker that the two choices are the only options. Therefore, if the recipients agree, and perceive a threat to their children/coming generations, then they are likely to do what they can to avoid an undesirable outcome. This extract contributes to the threats in the G-text.

Gore also evokes the words, ideology, and spirit of Mahatma Ghandi; ex. (4), and borrows an African Proverb; ex. (5). These examples express something that must seem important to the speaker or important for the speaker to let the recipients hear:

(4) Mahatma Ghandi awakened the largest democracy on earth and forged a shared resolve with what he called "Satyagraha" – or "truth force." (G, 31)

(5) "If you want to go quickly, go alone. If you want to go far, go together." (G, 34)

The origins of the quotes reflect the global collaboration that is presented as necessary in order to achieve the goals of Gore's lecture. Furthermore, ex. (4) evokes the biblical phrase 'the truth shall set you free", and the idea that once we learn the truth about the seriousness of the situation we are faced with, we will stand up and fight this challenge.

What lies behind the words in ex. (5), is the idea that people from all over the world must act together and participate to come up with the required solutions to the challenges we are presented with. The speaker presents a 'global collaboration frame' (cf. section 3.2). Furthermore, the extract is presented as analogous to what we must do now (cf. table 4.11).

Several of the quotes Gore includes reflect the necessity for decision-making:

(6) "It is time we steered by the stars and not by the lights of every passing ship." (G, 38)

Example (6), above, represents the words of Omar N. Bradley (the US Army's Chief of Staff, 1948-1949) (Bradley 1948), and ex. (7) are the words of Winston Churchill.

(7) "They go on in strange paradox, decided only to be undecided, resolved to be irresolute, adamant for drift, solid for fluidity, all powerful to be impotent." (G, 9)

These quotes are clearly intended to get a message across; we need to choose a course, and sooner rather than later. Gore also expresses this by means of a metaphor (see ex. (31) in 5.5.1 below). When Gore mentions Winston Churchill, and brings to mind memories of the Second World War, he attempts to create a link between that time and now. This is an attempt either to establish that the current situation is as serious, or, to call upon the will of the audience to make a choice. Winston Churchill is mentioned explicitly as the source of the quote in ex. (7), whereas the possibly less known General Bradley (for the general Norwegian audience) is introduced as one of the *visionary leaders* of the *generation that defeated fascism* (…) *in the 1940s* (App. 1 G38).

Projection

Through projection, it is possible to introduce "additional sources of evaluation" (Martin and Rose 2003). In a projection, a clause comes to function "as a representation of a (linguistic) representation" and the projecting clause and the projected clause have equal 'tactic' status, which is called 'parataxis' (Halliday 1994: 250). Halliday treats the projected clause as an individual clause element. In the projected clause in ex. (8), Gore presents the wanted goal or the intended effect of his speech:

(8) Even though I fear my words cannot match this moment, I pray what I am feeling in my heart will be communicated clearly enough that those who hear me will say "We must act." (G, 6)

The speaker projects the words of his audience, and attribute to them feelings and intentions, thus appealing to the audience's pathos (cf. section 1.6 above). The request is located at the beginning of the text, which establishes the speaker's agenda for his speech. The wheel comes full circle when he ends in similar form:

(9) So let us renew it, and say together: "We have a purpose. We are many. For this purpose we will rise, and we will act." (G, 59)

In ex. (9) the speaker again projects the words of his audience, and *will* indicates that they now agree, and have committed to future action.

There is a small risk involved in uttering ex. (9). Whether the audience will agree or not depends on the quality of the speaker's text. The speaker is in fact speaking *for* the audience, not only *to* them. Has he succeeded in getting their attention, and has he managed to lead them through his speech towards this goal? He has definitely made an effort, for instance with his interactional style (e.g. section 4.5.4). The projecting clause, which introduces ex. (9) above, is a final attempt.

The speaker uses 'simple' language and short sentences, with a repetitive sentence structure in both ex. (8) and ex. (9). A difference between ex. (8) and ex. (9) is that in ex. (8) the speaker has still to convince the recipients that 'action' is the right thing to do. He uses the modal verb *must* to express strong necessity, whereas in ex. (9) he uses *will*. In both examples Gore uses inclusive *we*. In ex. (9), this invites a finish that intends to unite, encourage, and convince. Like in ex (5) above, the speaker induces a 'global collaboration frame'.

In the next two examples, Gore projects the words of the next generation:

(10) Make no mistake, the next generation will ask us one of two questions. Either they will ask: "What were you thinking; why didn't you act?" (G, 56)

(11) Or they will ask instead: "How did you find the moral courage to rise and successfully resolve a crisis that so many said was impossible to solve?" (G, 57)

What Gore does in ex. (10) and ex. (11), similar to examples (8) and (9), is to introduce another source into the text. This time it is an invented source - the unknown *next generation*. This reflects the dialogic style of his communicative strategy. As with ex. (2) and (3), the speaker emphasises this generation's responsibility. That is, the speaker introduces a 'legacy frame' (cf. section 3.2).

5.2.1.2 Evidence in the P-text

In all, Pachauri has included eight chunks of text enclosed by quotation marks, but not all of these can be said to function as evidence on their own. Seven of the quotes can be said to function as evidence, and one is a fear appeal (section 5.3).

Opinions advanced by others

In ex. (12) Pachauri borrows the words of Mr Berge Furre, a member of, and deputy chairman for, the Norwegian Nobel committee from 2003-2008 (nobelprize.org 2).

(12) "We honour the earth; for bringing forth flowers and food - and trees… The Norwegian Nobel Committee is committed to the protection of the earth. This commitment is our vision - deeply felt and connected to human rights and peace" (P, 4)

It is likely that this example supports the opinion of Pachauri. This emotional evidence is strategically placed at the beginning of the speech, to establish, in simple terms, a connection between the work of the IPCC, the widespread impacts of climate change, and the security and protection of the earth. In addition, this quote from a respectable Norwegian, and a then member of the NPP Committee, is likely chosen to pay respect to and to show solidarity with the people of the host country (cf. ex. (2) above).

In ex. (13), the ancient Hindi philosophy of "Vasudhaiva Kutumbakam" is evoked. This philosophy is similar to the idea of a 'global village' (cf. Marshall McLuhan 1968), and it reflects Pachauri's ideological views (cf. sections 4.5.6 and 4.8 above):

(13) (…) the philosophy of "Vasudhaiva Kutumbakam", which means the whole universe is one family, must dominate global efforts to protect the global commons. (P, 5)

The philosophy introduced in ex. (13), reflects the culture and ideology of a whole society, not just one person's opinion. The speaker thus invokes a 'global collaboration frame', similar to Gore. The Indian name of the concept and the English translation helps create, or reawaken in the minds of the recipients, a connection between an ancient Hindi philosophy, and an equivalent idea that sprung out of the technical modernisation of the western world. McLuhan notes that "electronics and automation make mandatory that everybody adjust to the vast global environment as if it were his little home town" (1968: 11). Similarly, the climate changes can make global collaboration mandatory in order to reduce the projected damaging impacts.

Example (13) suggests that this philosophy reflects some of Pachauri's ideological beliefs. In addition, evoking ancient wisdom is a means of borrowing authority, and it shows that the speaker is well read.

In both ex. (14) and ex. (15), Pachauri uses the 'reporting verbs' *said* and *referred to*, to introduce the citation, which both express 'Discourse Acts' (Hyland 1999: 349):

(14) When Mr Willy Brandt spoke at the acceptance of the Nobel Peace Prize in 1971, he said "…we shall have to know more about the origins of conflicts. … As I see it, next to reasonable politics, learning is in our world the true credible alternative to force." (P, 32)

(15) The question is whether the participants in Bali will support what Willy Brandt referred to as "reasonable politics" (P, 33)

In order to classify *reasonable politics* in ex. (15) according to what Perloff considers evidence (cf. section 5.2), it is necessary to consider the context. In this case, ex. (15) functions as an 'opinion advanced by others'. It is also a repetition from ex. (14).

In ex. (15), the concept *reasonable politics* is linked up to the 'participants in Bali' who can actually change the political course and make decisions that will affect us (unfccc.int). The speaker thus targets the decision makers.

In ex. (15) 'reasonable politics' is incorporated in Pachauri's own words. However, Pachauri uses a distancing strategy by including (…) *what Willy Brandt referred to as "…"*. This may reflect an academic background, which teaches us to cite carefully every source. The source is not just a random person; rather, he is a previous Laureate and a former political authority (cf. section 5.4 below) (nobelprize.org 3).

Eyewitness statement /narrative report

Both ex. (16) and ex. (17) are narrative evidence in which we, as recipients, are invited to share the problems and challenges of the population of the Maldives. The extracts can thus be perceived as warnings:

(16) It would be relevant to recall the words of President Gayoom of the Maldives at the Forty Second Session of the UN General Assembly on the 19 October 1987: "As for my own country, the Maldives, a mean sea level rise of 2 metres would suffice to virtually submerge the entire country of 1,190 small islands, most of which barely rise 2 metres above mean sea level. That would be the death of a nation. With a mere 1 metre rise also, a storm surge would be catastrophic, and possibly fatal to the nation." (P, 27)

(17) "Ten years ago, in April 1987, this very spot where we are gathered now, was under two feet of water, as unusually high waves inundated one third of Male, as well as the Male International Airport and several other islands of our archipelago." (P, 28)

The narrative report in ex. (17) gives the audience a report from someone who was presumably present at the time. Both ex. (16) and ex. (17) will, if 'successful', engage the audience's imagination and emotions. In addition, the narrative in ex. (16) spells out exactly how bad it could be for the Maldives, if what the IPCC report predicts comes true. These two examples resemble the 'threat information' in a fear appeal, which is the element in the appeal that induces fear (section 5.3 below). Maibach et al. (2008) note, however, that people do not always care strongly about what goes on far away, and they suggest that tailored messages would be more efficient (cf. section 3.2). In other words, bring the warning closer to home. One last point to notice about ex. (16) is that by means of the projecting clause, Pachauri expresses that he deems the projected clause as pertinent (cf. ex. (14) in section 4.2.3 above).

Factual assertion

In ex. (18), another type of evidence is used. Example (18) is a more rational type of evidence than the six above examples. The example is from the Fourth Assessment Report:

(18) We have now more scientific evidence of the reality of climate change and its human contribution. As stated in the Fourth Assessment Report, "warming of the climate system is unequivocal", and "most of the global average warming over the past 50 years is very likely due to anthropogenic greenhouse gases increases". (P, 29)

Similar to some of the examples from the P-text in chapter 4, ex. (18) also contains technical terminology. In particular, *global average warming* and *anthropogenic greenhouse gases increases* are phrases that may not be so familiar.

The quote supports Pachauri's statement in the previous clause: *We have now more scientific evidence* (…). The link is expressed in Pachauri's projecting clause (*As stated…*), where the reporting verb conveys the activity reported (see Hyland 1999: 344). Considering the fact that the P-text is a highly informative text, the speaker is likely to cite the source of information. Hyland notes that citation is a part of a researcher's process of presenting his or her research in order to gain acceptance (1999: 341-342). As Chairman of the IPCC, Pachauri along with the IPCC Secretariat plans, manages, and oversees all IPCC activities (ipcc.ch 3.). Thus, he is familiar with the report, and is responsible for it, even if he himself has not performed any research that contributes to its contents.

5.2.2 Observations on the use of evidence

Gore addresses the audience, and invites them along on his communicative journey through this lecture. Introducing another voice enables the speaker to ask questions that would have

sounded more accusatory if the speaker himself had addressed them to the audience. The way they are presented now, they appear to be directed at this generation; the audience and the speaker included. This strategy may be called a 'legacy frame'.

Pachauri is not as inclusive in his communicative style, but he has means of addressing the policy makers, which suggest a wrong decision will label them 'unreasonable politicians'. In addition, both speakers induce a 'global collaboration frame'. Pachauri, like Gore, appeals to the audience's pathos in the evidence. The eyewitness statements from President Gayoom are examples of this.

Additionally, the different sources that are quoted in both texts suggest for the audience that these are well-read speakers with knowledge of various fields, such as literature, science, politics, religion, different cultures, and history (cf. section 5.4 below). Thus, the evidence constitutes an extra source of authority contributing to strengthening the speakers' ethos.

5.3 Fear appeals

A fear appeal is a persuasive form of communication "that tries to scare people into changing their attitudes by conjuring up negative consequences that will occur if they do not comply with the message recommendations" (Witte, Meyer, & Martell 2001: 20; in Perloff 2003: 187). By appealing to people's fears, the speaker can evoke different reactions in the recipients (Perloff 2003). This is what Maibach et al. propose as effective climate change messages (cf. section 3.2 above).

This is a negative communicative strategy, since the speaker induces fear to achieve the communicative goal. The ideal result is to move people into 'danger control', in which case they want to try to change the situation or their behaviour to avoid what scares them. One example is anti-smoking campaigns and commercial, as shown in ex. (19):

(19) There are more than 4,000 chemicals in cigarette smoke. Some of them are also in wood varnish, the insect poison DDT, arsenic, nail polish remover, and rat poison (Smokefree.gov , 2000).

Fear appeals comprise a necessary persuasive strategy since people are easily tempted to do things that can cause harm to them, others, or the society (Perloff 2003: 187). However, fear appeals can backfire if they arouse too little or too much fear. The message recipients must be convinced that they are "susceptible to negative outcomes and that the recommended response will alleviate threat" (Perloff 2003: 191). Accordingly, in addition to scaring the audience, the

speaker must convince them that they are capable of avoiding the threat. Otherwise the recipients may be scared into 'fear control', in which case they focus on the fear itself, (Perloff 2003). With the example from the anti-smoking campaign, this would suggest that instead of deciding to quit smoking, the recipient would light a cigarette to calm his nerves.

Weinstein found that people are likely to believe that bad things do not happen to them (Weinstein 1980; 1993; in Perloff 2003). This is called "unrealistic optimism" or "the illusion of invulnerability" (Perloff 2003: 188). This tendency in people works as a barrier to the success of fear appeals, because if a person does not believe, or does not want to believe that he is susceptible to danger, then he is "unlikely to accept the persuader's advice" (Perloff 2003: 190).

For the fear appeal to work, the message must work on both the cognitive and the emotional level. The persuader must convince the recipients that the negative outcomes are a threat to them personally and that the suggested response will relieve the recipients of the threat (Perloff 2003; Maibach et al. 2008). Thus, it is important that the message contain both 'threat information' and 'efficacy information' (Witte 1998; in Perloff 2003: 191-193):

- **Threat information** consists of information about the seriousness of the threat (severity information) and information about the likelihood that the threatening outcomes will occur (susceptibility information).
- **Efficacy information** consists of information about the influence of the recommended action (response efficacy) and arguments that the person/s is/are capable of doing the recommended action (self-efficacy information).

One example to illustrate this: On April 16, 2007, 33 people were killed, and several wounded, on the campus grounds of Virginia Polytechnic Institute and State University (Hauser and O'Connor, April 16 2007). This tragedy provoked a press release from The Knights Party, also known as The Knights of the Ku Klux Klan. In their press release, the incident at Virginia Tech is linked to the party's platform on gun control:

Threat information: **Those who are intent on hurting others** will not stop because there are a few gun laws on the books.

Efficacy information: The answer to violence in America is more guns on the streets and a population ready and knowledgeable in the area of self-defense. If we are to value human life, then shouldn't we allow our citizens to defend it? (Robb 2007)

The text in bold constitutes the severity information, and the underlined text constitutes the susceptibility information. The efficacy information provides information about how the threat can be limited.

This strategy also appears in the two texts (section 5.3.2). Here is one example from Gore:

Threat information: We, the human species, are confronting **a planetary emergency – a threat to the survival of our civilization** that is gathering **ominous and destructive potential** even as we gather here.

Efficacy information: But there is hopeful news as well: we have the ability to solve this crisis and avoid the worst – though not all – of its consequences, if we act boldly, decisively and quickly. (G, 8, both extracts)

The point is that fear appeals are used in different genres, by different speakers and for different occasions, as a communicative strategy. Whether the idea is to persuade people to quit smoking, abolish anti-gun laws, or to encourage global collaboration to limit the consequences of global warming, the design is that the speaker induces some pain in hope of producing some gain. To achieve this, the threat must not cause the recipient to take 'fear control' but rather encourage 'damage control', and a belief that the recipient is capable of avoiding the threat.

5.3.1 A consideration of fear appeals in the data

This section on fear appeals will consider how the included quotes are used as fear appeals or part of a fear appeal, and limit itself to present one fear appeal in the speakers' own words from each text.

5.3.1.1 Fear appeals in the G-text

The G-text uses some of the 'opinions advanced by others' as part of a fear appeal. In ex. (20) and ex. (21), both quotes can be said to function as threat information:

(20) Scientists reported with unprecedented distress that the North Polar ice cap is "falling off a cliff." (G, 13)

(21) "Some say the world will end in fire; some say in ice." Either, he notes, "would suffice." (G, 25) (Robert Frost)

Both of these examples pertain to the impacts of climate change, but none of the examples contain technical language. Example (20) introduces a metaphor that *scientists*, presumably, have used to explain what is happening to the North Polar ice cap. In itself, ex. (20) may not seem like such a problem. Whether the audience perceives this as a threat depends on their

knowledge of what will happen if the North Polar ice cap disappears. Example (21) provides a presumably clearer image, as *ice* may evoke the idea of an ice age, and *fire*, may evoke images of hell. These threatening messages are followed by the following encouraging extract:

(22) But neither need be our fate. It is time to make peace with the planet. (G, 26)

Example (22) is part of the efficacy information. Here, the speaker tries to convince the audience that there is still hope, and that the time to act is now.

5.3.1.2 Fear appeals in the P-text

Of the quotes in the P-text, the following functions as part of a fear appeal. This clause from a resolution of the UN General Assembly constitutes threat information:

(23) "**Noting with concern that the emerging evidence indicates that continued growth in atmospheric concentrations of "greenhouse" gases** could produce global warming with an eventual rise in sea levels, the effects of which could be disastrous for mankind if timely steps are not taken at all levels". (P, 3)

The text in bold is the susceptibility information, and the underlined text is the severity information. Thus, in ex. (23), the information about the likelihood of the occurrence of the threat is presented before the information about the seriousness of the threat. This quote does not contain the efficacy information, and consequently, it is likely that the quote was included to emphasise the seriousness of the situation.

The next example is the speaker's own words, and this example proves an interesting point in the P-text: In the previous paragraphs, paragraphs 6 and 7 (see App. 1), Pachauri has presented several bits of information that constitute threat information, and where it would have been appropriate to include the efficacy information he says instead:

(24) Since the IPCC by its very nature is an organization that **does not provide assessments, which are policy prescriptive**, it **has not provided any directions** on how conflicts inherent in the social implications of the impacts of climate change could be avoided or contained. **Nevertheless**, the Fourth Assessment Report provides scientific findings that other scholars can study and arrive at some conclusions on in relation to peace and security. **Several parts of our reports** have much **information and knowledge that would be of considerable value for** individual researchers and think tanks dealing with security issues as well as governments that necessarily are concerned with some of these matters. **It would be particularly relevant to** conduct in-depth analysis of risks to security among the most vulnerable sectors and communities impacted by climate change across the globe. (P, 7)

In this manner, Pachauri does not explicitly give any efficacy information. He suggests some recommended actions, but does not mention any response efficacy or self-efficacy

information. He merely suggests that *individual researchers*, *think tanks*, and *governments* would benefit from this *information and knowledge*. It seems that Pachauri's speech is not so much directed at the common people and what they can do in their everyday life; rather, it is more focused at reaching the policy makers; "those responsible for decisions in the field of climate change at the global level" (see further ex (64) section 5.5.1, subsection 8 below). The first part of this extract was discussed in chapter 4 (ex. (11) in section 4.2.3).

5.3.2 Observations on the use of fear appeals

There are few examples from the texts where the quotes function as a fear appeal by themselves. The data for this section was very limited, and the discussion shows signs of this. However, inducing fear and giving warnings seem to happen quite frequently in both texts, which the discussions in chapter 4 and in section 5.2.1 illustrate.

Pachauri's text presents a summary of the Fourth Assessment Report, and consequently the text is technical and contains predicted and potential impacts of climate change. These predictions and possible scenarios resemble a (weakened) piece of threat information in a fear appeal, even though the threat may not be so obvious and explicit.

Gore expresses urgency to act, and, by means of the encouraging, command-like examples discussed in section 4.5.1, he attempts to give the audience efficacy information. In the examples conveying ability in sections 4.2.2 and 4.2.4, both speakers attempt to give efficacy information, by providing damage-reducing solutions or suggestions.

5.4. Considering the sources

This section will consider the sources the speaker's have used. Some of them have been introduced already, so this section will supplement the previous presentations.

The two texts use different types of sources; and the G-text draws on twice as many sources as the P-text. This may be explained by the fact that almost 55% of Pachauri's text is a summary of scientific findings and hedged warnings (cf. section 4.3.3). This will affect the space available for including additional sources and citations.

List 5.1: Sources in the G-text

1. African proverb (ex. (5), in section 5.2.1.1).
2. Svante Arrhenius, Nobel Prize in chemistry (Nobelprize.org 4).

3. Omar N. Bradley, the US Army's Chief of Staff, 1948-1949, (ex. (6), in section 5.2.1.1).
4. Winston Churchill, politician, and wartime prime minister (ex. (7), in section 5.2.1.1) (bbc.co.uk 1).
5. Robert Frost, American poet (ex. (21), section 5.3.1.1).
6. Mahatma Gandhi, spiritual/ political leader, and humanitarian (ex. (4), in section 5.2.1.1) (lucidcafe.com).
7. Henrik Ibsen, Norwegian playwright (ex. (2), in section 5.2.1.1).
8. Antonio Machado, Spanish poet, (App. 1 (G53)).
9. The Old Testament (ex. (3), in section 5.2.1.1).
10. George Orwell, journalist and author (App. 1 (G20)) (bbc.co.uk 2).
11. Franklin Roosevelt, 32. President of the United States (App. 1 (G39).
12. Scientists (twice.) (ex. (20), in section 5.3.1.1; ex. (26) in section 5.5)

List 5.2: Sources in the P-text

1. Willy Brandt (ex. (14) and ex. (15), section 5.2.1.2).
2. Berge Furre, politician, and former deputy chairman of the Norwegian Peace Prize Committee (ex. (12), section 5.2.1.2).
3. The Fourth Assessment Report (ex. (18), section 5.2.1.2).
4. President Gayoom, the former president of the Maldives (ex. (16) and ex. (17), section 5.2.1.2).
5. The UN, General assembly (ex (23), section 5.3.1.2).
6. The philosophy of "Vasudhaiva Kutumbakam" (ex. (13), section 5.2.1.2).

5.4.1 Discussion

Lists 5.1 and 5.2 illustrate all the sources used by the two Laureates in their speeches. As mentioned, Gore uses almost twice as many sources as does Pachauri. Gore includes quotes from several authors and poets, and great political figures. Gore cites, amongst others, a biblical verse, Henrik Ibsen and Winston Churchill. Three of the included voices in the G-text are linked to the Second World War, which is likely to evoke the memories of that war, and that threat, and it invites the comparison between this situation and that time (see ex. (34) in 4.4.2 above). In addition, the speaker presents the situation as if we were at war with the planet (e.g. ex (36) in section 5.5.1 below). Gore cites *science* and *scientists* on a few occasions, without detailing *which* scientists. This is likely a consequence of the speaker's focus. Gore is not that concerned with the specific technical details, rather he is focused on how he can convey the information in a comprehensible, and (occasionally) fear provoking manner (cf. e.g. section 5.3.1.1 above).

Pachauri appears more modest and less passionate, considering the sources he includes. Pachauri cites the Fourth Assessment Report, President Gayoom, and Willy Brandt. The ancient philosophy, the quotes from President Gayoom, and the quote from the UN are more

emotional examples than the other quotes, but all over, the P-text expresses a more solemn style than the G-text.

The sources the speakers have included are most likely chosen because they fit in with the communicative style and goal of the speaker. As chapter 4 showed, the two speakers may have a similar goal: to inform an audience about the seriousness of the situation. However, from there on they differ greatly.

Pachauri's text is more informative than the G-text. His communicative style is more solemn and more contained than Gore's, and so are his quotes. By comparison, Gore's communicative style is very emphatic. He explicitly states his communicative goal: that people will see the need to act (cf. the discussion under 'projection' in section 5.2.1.1).

The modality analysis in chapter 4 pointed out that Gore uses inclusive *we* on several occasions and that he issues suggestions and advice, expressing various degrees of necessity and obligation depending on the Subject (cf. section 4.5.1*ff* and table 4.11). The examples in table 4.11 all encourage people to think *we must act*, but none of the examples state explicitly *how*. The quotes and projections Gore has included appear to fit in with his communicative style, and they contribute by functioning as warnings and expressing the voices of our future children.

I would like to call attention to one last feature of the G-text before moving on to language intensity. There seems to be similarities in the style of Gore and Martin Luther King Jr. (MLK), at least concerning the language choices in the opening and concluding paragraphs:

> Unexpectedly, that quest has brought me here. Even though I fear my words cannot match this moment, I pray what I am feeling in my heart will be communicated clearly enough that those who hear me will say, "We must act." (G, 6)
>
> So I want to end as I began, with a vision of two futures – each a palpable possibility – and with a prayer that we will see with vivid clarity the necessity of choosing between those two futures, and the urgency of making the right choice now. (G, 54)
>
> So let us renew it, and say together: "We have a purpose. We are many. For this purpose we will rise, and we will act." (G, 59)

The first of these extracts are from the opening paragraph and the latter two appears towards the end of Al Gore's Nobel Lecture. The next two extracts are from the opening and closing paragraphs of MLK's Nobel Lecture in 1964, when he received the Peace Prize:

> Occasionally in life there are those moments of unutterable fulfillment which cannot be completely explained by those symbols called words. Their meaning can only be articulated by the inaudible language of the heart. Such is the moment I am presently experiencing.
>
> Let me close by saying that I have the personal faith that mankind will somehow rise up to the occasion and give new directions to an age drifting rapidly to its doom. In spite of the tensions and uncertainties of this period something profoundly meaningful is taking place (both extracts from King, Dec 11, 1964).

Gore's text openings and closing bear a close resemblance to the language and style of MLK's lecture. For the record, I do not know which other Nobel lectures Gore read before writing his own. However, I do know that the Laureates are provided with examples of previous Nobel Lectures (section 1.2). In addition, all the Lectures are available from the official web site of the Nobel Institute (Nobelprize.org 1).

It appears that Gore has been inspired by MLK's speech and style, and by extension, Gore borrows King's authority and increases his own ethos and ethical qualities (section 1.6). Those familiar with MLK might notice traces of the style, emphatic language, and dynamism of MLK in Gore's text.

MLK was a Baptist minister, whose sermons included emotional language and communication with the congregation (Brunvoll 1992). Brunvoll considered MLK's texts in terms of overarching goal, 'global speech act'. Brunvoll notes that a whole text could have as overarching goal to argument for action, and that the individual parts, and utterances in the texts could be used to lead up to this point (1992: 104). Brunvoll proposed that one text started out with the 'illocutionary force' of justifying, and moved on to presenting information, which lead up to an argumentation for action (1992: 104). A similar structure appears in Gore's text. Gore presents this 'global' goal in the first of the two examples above, and throughout his text, he uses threats, warnings, analogies and encouragements, which leads up to the last paragraph, extract (G, 59) above.

Another feature Brunvoll found in MLK's style was the act of requesting through urging and demanding (1992: 118). MLK would use urging requests directed at African-Americans, and demanding requests directed at White Americans/authorities. This is similar to what Gore does in the examples in sections 4.5.1*ff* above, where he demands action and expresses requests, signalled through the MAs *must* and *should*, *need* and *have to*.

5.5 Language intensity: metaphors

Turning now from the message content to the message form, this section focuses on language effects. Perloff (2003) includes speed of speech, powerless versus powerful language, strong and vivid language and emotionally charged words. He suggests that this is "the province of political rhetoric, social activism, hate speech, and eloquent public address" (Perloff 2003: 202). This paper is limited to considering metaphors.

Note that what is analysed as metaphorical in this paper, does not necessarily mean that the speaker had a metaphoric intention, or that the hearers will recognize the language as metaphorical. Rather, the particular use of a single word, or phrase, has the "*potential* to be recognised and processed as metaphorical" (Semino 2008: 13). The metaphors presented in section 5.5.1 below are just a selection of the metaphors and rhetorical features (simile, metonymy, three-part lists, and alliteration, to name but a few) that appear in the texts.

A metaphor's primary function is understanding: "*The essence of metaphor is understanding and experiencing one kind of thing in terms of another*" (Lakoff and Johnson 1980: 5, no emphasis added). That is, when we attempt to find another way of explaining or presenting a concept, we do this in order to get a deeper understanding of this target. The origin of Lakoff and Johnson's conceptual metaphors come from the idea that the human conceptual system, our sensory and motor systems, is fundamentally metaphorical in nature (1980: 3). They argue that "human *thought processes* are largely metaphorical" and that linguistic expressions of metaphors are possible precisely "because there are metaphors in a person's conceptual system" (1980: 6).

Lakoff (2008) states that even after 28 years, certain facts about metaphors are still valid: "metaphors are conceptual mappings; they are part of the conceptual system and not mere linguistic expressions" (2008: 24). That means that it is still an accepted idea that those concepts that govern our thoughts, also govern how we relate and interact with other people, what we perceive, and how we orient ourselves in the world. The conceptual system is usually not close to the surface in our everyday awareness.

Lakoff and Johnson (1980) used the following phrase to explain the conceptual mapping between target and source: target-domain is source-domain, or, target-domain as source-domain (TIME IS MONEY, or 'time as money') (1980: 7). Lakoff (2008) states that this is still a valid perception of metaphors; "via metaphorical mappings, source domain structures

(…) are used for reasoning about the target domain" (2008: 24). From this, it follows that linguistic metaphors originate in underlying, conceptual, metaphors that are connected to human bodily experiences like space and movement.

Lakoff and Johnson (1980) distinguished between conventionalised and novel metaphors (cf. Lakoff 2008: 25). In a novel metaphor, the 'base' creates new information about the target, for instance by introducing a new focus on the target. That is, with a new metaphor, we get a deeper understanding of the target. Conventionalised metaphors are harder to notice as they have been "absorbed into the conventions of everyday language" by repeated use (Sopory and Dillard 2002: 408). An example of conventionalised metaphors is given in ex. (25):

(25) President Obama's decision to **lift** restrictions on federal financing of embryonic stem cell research could cause state governments and philanthropists to **pull back on** billions of dollars they have pledged for such work (Pollack, March 10 2009).

A novel metaphor can cause semantic tension because a familiar word or phrase – the target – occurs in an unexpected context (Charteris-Black 2004; Bhatia 2007). These metaphors draw attention to similarities across different domains. This might highlight one side of a concept and tone down another side. Therefore, when Gore says *It is time to make peace with the planet* (Ex. (36), subsection 2 below), he suggests that we are at war, or in conflict, with the planet, so as to highlight this aspect.

The phrase, *to make peace with*, usually occurs with human participants and it indicates *to end an argument with someone and stop feeling angry towards them* (Macmillan). By extension, in this context, we are offered the idea that we are hurting the planet. This further invites the hearer to conceive the issue of climate change as an interpersonal relation, and in this relationship, the world needs our help.

Lakoff and Johnson (1980) refer to this as personification. Viewing an abstract entity "in human terms has an explanatory power of the only sort that makes sense to most people" (ibid: 34). Personification allows us to grasp a non-living object or entity as a human-like thing, embodying human emotions, qualities, motivations, and activities (Lakoff and Johnson 1980: 33). Thus, personification can be seen as ontological, or existential, metaphors.

A metaphor can present certain issues in a particular way, which reflects how the speaker considers something. Fairclough argues that ideology is reflected in metaphors because "any aspect of experience can be presented in terms of any number of metaphors" (2001: 99-100).

Therefore, a particular metaphor chosen among other possibilities reflects what the speaker wants to focus on.

A metaphor that draws attention to similarities across different domains is 'nuclear winter', which helps describe the consequences of a global nuclear war (Schell 1982; in Perloff 2003: 202). Gore includes the term in his text:

(26) More than two decades ago, scientists calculated that nuclear war could throw so much debris and smoke into the air that it would block life-giving sunlight from our atmosphere, causing a "nuclear winter" (G, 23).

Gore also conjures up the term 'carbon summer' as a description of the consequences of global warming (Zimmer 2007):[10]

(27) (...) we are in danger of creating a permanent "carbon summer" (G, 24).

The metaphors 'nuclear winter' and 'carbon summer' in ex. (26) and ex. (27) are used to evoke a certain type of understanding and experience that could not be possible by means of another description. The issues of 'the consequences of a global nuclear war' and 'global warming induced by CO_2 emission' are presented as phenomena related to seasons, and in this light evokes connotations like unpleasantly 'cold' and 'hot'. 'Carbon summer' may evoke less positive feelings than 'global warming'. Maibach et al. note that "*global warming* may sound like a positive change to some individuals" (2008: 496).

By using metaphors in the discourse on climate change, this issue can be made more comprehensible and tangible to a non-professional. The metaphor provides a way of explaining climate change by presenting it as something else. That is, the less congruent manner in which a concept can be presented may increase comprehension for someone who is an outsider to a particular field. With an issue like the climate change, metaphors may provide the additional information needed for an outsider to understand the complexities. This is precisely what Maibach et al. (2008) feel is missing from the discourse on climate change (cf. section 3.2 above).

5.5.1 A consideration of metaphors in the data

Modality conveys the speaker's attachment to his message, and the certainties the speaker has chosen to express regarding an issue, and intense language conveys the speaker's stance in

[10] (Zimmer 2007) *Carbon summer* first turned up in a hearing held by the U.S. House Committee on Science, Space, and Technology on "Technologies for Remediating Global Warming", on June 29, 1988. Dr. Erik Storm of the Lawrence Livermore National Laboratory made the parallel to 'nuclear winter' during this hearing.

relation to an issue. Both of these contribute to convey the speaker's ethos, and his appeals to the audience's pathos (section 1.6). Intense language, such as metaphors, colours a speaker's presentation and emphasises some sides or aspects rather than others.

Chapters 2 and 4 introduced and discussed 'modal metaphors' as a strategy, applied in the P-text in particular, that comprise an impersonal communicative style. In this part of the discussion, these types of metaphors are left out of the discussion, and the focus is on linguistic metaphors (cf. section 5.5 above). This presentation will discuss some of the metaphors in the two texts and consider what they contribute to the texts. Unfortunately, due to limited time it was not possible to locate all the potential metaphors in the two texts.

The metaphors are presented under various conceptual headlines (cf. Lakoff and Johnson 1980; Charteris-Black 2006). They are the following seven groups, or domains, of conceptual metaphors: 1) JOURNEY metaphors; 2) WAR metaphors; 3) the climate change is a threat/ an adversary; 4) metaphors of illness; 5) life/creation vs. death/destruction; 6) TIME IS A LIMITED RESOURCE; and 7) CONTAINER metaphors.

Category 3) is related to category 2), but the examples in 3) did not quite fit into the 'war frame' in category 2), so I wanted to include a separate category. In addition, category 8) presents some of the personifications that function as extensions of ontological metaphors.

1) JOURNEY metaphors

Lakoff and Johnson (1980: 85) introduced the complex conceptual metaphor LOVE IS A JOURNEY, which is a composition of several conceptual metaphors, such as 'purposes are destinations' and 'a relationship is a container' (cf. Lakoff 2008: 25).

Charteris-Black (2006) suggests that journey metaphors can be used to create solidarity, because they encourage followers to reach a common purpose, or destination. Reaching this destination may involve some suffering, sacrifice, and struggle. This is implied in the G-text (e.g. ex. (28)).

The G-text:

The potential journey metaphor in ex. (28) suggests that *we, the human species*, are on collision course with a *planetary emergency*:

(28) We, the human species, are **confronting** a planetary emergency (G, 8)

Confronting may or may not be metaphorical, as one meaning of this verb is that if you are confronting a problem, or it confronts you, you have to deal with it (Macmillan). Presumably, this is what Gore wants the audience to focus on. By presenting the impacts of climate change as *a planetary emergency*, Gore illustrates the need to take action against it – or to confront it. The speaker suggests in ex. (28) that both the *planetary emergency* and we are moving forward, and that we are on collision course.

Gore seems to think that some of us are dealing with this confrontation the way we should, which is implied in ex. (29). Here, *the steps they've taken* can be perceived as metaphorical:

(29) I salute Europe and Japan for **the steps they've taken** in recent years **to meet the** challenge (G, 48)

In ex. (29), 'Europe' and 'Japan' substitute the specific reference to the governments of Japan and the individual countries in Europe (metonymy).

One potential reading of ex (29) is that *Europe* and *Japan* are personified and ascribed with human characteristics of movement. This metaphor would indicate that movement is progress. The speaker's praise contributes to this understanding. In such a reading, also *the challenge* can be seen as a personification, and as presented as an adversary, in both ex. (28) and (29).

The examples under subsection 2 will illustrate that the speaker continues to present the climate change as a *threat*. In ex. (29), the speaker suggests that we must meet the challenge. Our *steps* need to move towards the crisis, and not away from it. Another reading of ex (29) is that *steps* suggest the necessary actions made in order to reach a goal (Macmillan), in which case the example is not metaphorical. As Semino (2008) points out, what the speaker intended, and what the audience perceive, may not be metaphorical, except in the eyes of the analyst (see section 1.4.2.1).

Example (30) provides a different way of considering the future, as the future is presented as a *difficult* journey:

(30) **The way ahead is difficult**. (G, 52)

In ex. (30), the potential metaphor illustrates that what we need to do will not be easy. Extract (30) presents only one option: *the way ahead* – which *is difficult* – is the one we have to take.

Journeys also have a destination, and the speaker presents it as essential that we take the right *path*:

(31) We are **standing at the most fateful fork in that path**. (G, 55)

Example (31) makes explicit that we have reached a point where we need to make a choice. The *fateful fork* implies that the road we take – the choice we make – will have serious consequences for the future. The noun phrase is modified by *the most* which also adds emphasis. Examples (30) and (31) both suggest that *because* we are facing such a difficult struggle, we hesitate to make our decision, and these two examples may more easily be perceived as metaphorical (cf. ex (28) and (29)). By extension, the speaker presents *we* as insecure and without a clear vision of where *we* want to go, or how *we* want to get there.

The P-text:

Pachauri presents the situation as a *challenge* that we are facing. This challenge is a *large* obstacle that will only increase in size if we do not increase our pace:

(32) So the challenge **before us** is not only a large one, it is also one in which every year of **delay** implies a commitment to greater climate change in the future. (P, 26)

Despite the seriousness of the situation, Pachauri notes that *human society* has what it takes to approach the *challenge*:

(33) However, it is within the reach of human society **to meet** these threats. (P, 20)

The speaker suggests that stopping, or not acting, is negative. Forward is progress, hiding is neither progress nor retreat:

(34) Hazards from the impacts of climate change are, therefore, a reality today in some parts of the world, and **we cannot hide under global averages** and the ability of affluent societies to deal with climate-related threats as opposed to the condition of vulnerable communities in poor regions of the globe. (P, 28)

Nothing happens when you hide; you wait passively so no one finds you, or you run from cover to cover. In neither situation do you actively plan how you can avoid hiding. To hide indicates that the journey is on hold, and by extension, there is no progress. *Hide* also signifies that the speaker deems this a cowardly move.

In these examples, the speaker presents in simple language the consequences if we do not act now (32), that we are capable of dealing with *these threats* (33); and that we need to aim for a just sharing of responsibilities (34).

2) WAR metaphors

Weingart, Engels and Pansegrau (2000) note that if political discourse frames the climate problem as "a future *catastrophe*, it means that immediate action is required to prevent the catastrophe or alleviate its impacts" (Weingart et al. 2000: 272).

The G-text:

By saying that *we have begun to wage war on the earth itself* the speaker invites the hearers to question this proposition. It draws attention to the seriousness of the situation, and to the fact that the human species is dependent on the planet. It might provoke the question; has it come this far?

(35) Indeed, without realizing it, we have begun to **wage war** on the earth itself. (G, 22)

(36) It is time to **make peace with** the planet. (G, 26)

Example (35) suggests that we are actually close to war, or in conflict, with the planet, and example (36) states that now is the time to stop this before it escalates. The extracts explain this in simple terms. Example (35) is likely to be perceived as a threat or a serious warning.

Example (36) can be understood as an attempt by the speaker to be a moral guide, someone who knows the answers and has seen clearly the problems we are facing. It is a powerful move to classify a situation as a state of war.

Gore frequently refers to the climate changes as *a threat*. He also uses *crisis* 12 times, in combination with *climate* (*crisis*) (cf. ex. (38)) or *this* (*crisis*). By using these terms, Gore attempts to turns this huge and complex phenomenon into something more tangible – an adversary. This might be used to create a common goal, or target, and encourage action to ward of the threat. It might also be an effective metaphor (see section 3.2).

Once something is established as a threat, action should be taken (cf. "Target: Iraq" Lule 2004). In addition, once something is established as a threat to all of us, then we are more likely to put aside differences, and to stand together to fight the threat (cf. Charteris-Black's 2006 study of metaphor use by Winston Churchill; also Bhatia's 2007 study of discourse of terrorism as illusion).

(37) **A threat** to the survival of our civilization that **is gathering ominous and destructive potential** (G, 8)

(38) Now comes **the threat of climate crisis - a threat that is real, rising, imminent, and universal**. (G, 30)

These two examples from the G-text present the climate changes as a person, and furthermore, as an adversary. Gore gives the climate change superhuman-like qualities; it is *ominous and destructive*, *real, rising, imminent, and universal*. By extension, such an enemy needs to be defeated. Example (37) is an attempt to unite (*our civilization*), and both examples appeal to the audience's pathos, by evoking fear.

In the G-text, there is one occurrence of *catastrophe*, which refers to the climate impacts. Neither *catastrophe* nor *planetary emergency* (ex. (28) above) occurs in the P-text.

(39) Moreover, **the catastrophe now threatening us** is unprecedented - and we often confuse the unprecedented with the improbable. (G, 19)

It is easier for Gore, as an independent speaker, to speak his mind, than it is for Pachauri, who speaks on behalf of the scientific community of the IPCC, which have to be objective and policy-neutral (cf. section 1.5.2.2). This may provide an explanation as to why the speakers differ in what they allow themselves to be overt or covert about.

The P-text:

A *clarion* is a trumpet, which was used to signal war (dictionary.oed.com), so a *clarion call* would be the war signal. The more modern use of *clarion call* is that it is a public request to take action (Macmillan), in ex. (40) it can be seen as a public request to protect the earth:

(40) Honouring the IPCC through the grant of the Nobel Peace Prize in 2007 in essence can be seen as **a clarion call** for **the protection** of the earth as it faces the widespread impacts of climate change. (P, 4)

(41) These three realities encircle an important truth that must dominate global efforts to **protect** the global commons. (P, 5)

Pachauri focuses on the need for protection in ex. (40) and ex. (41). Both *the earth* and *the global commons* need protection from the impacts of climate change, as they might expect a *grave and disastrous* future.

(42) The implications of these changes, if they were to occur would be **grave and disastrous**. (P, 20)

Although Pachauri includes quite strong adjectives to describe the consequences in ex. (41), the whole sentence is hedged by the *if*-clause, *were to*, and *would*.

As noted in section 2.4.2 *were to* typically occurs in formal contexts to express future hypothetical meaning. The effect is slightly odd; do we believe the changes will happen; and do we believe that *if* they happen, they will be as serious as projected?

Spencer Weart said, in an interview to *The New York Times* on October 13, 2007, that the IPCC "was set up to be the lowest common denominator, to weed out anything anyone could disagree with", and that "when the I.P.C.C. says you're in trouble, you're really in trouble" (Revkin October 13, 2007). Thus, it could be a good idea to consider seriously the warning in ex. (42).

3) The climate change is a threat/ an adversary

As mentioned at the beginning of this section, this category is related to the war metaphors presented above.

The P-text:

One difference between the G-text and the P-text is that Gore presents the phenomenon as *a threat* or *the threat* (cf. subsection 2), whereas Pachauri uses slightly less determinate descriptions such as *these threats* and *novel risks*:

(43) However, it is within the reach of human society to meet **these threats**. (P, 20)

(44) **But climate change poses novel risks** often outside the range of experience (P, 21)

Pachauri never uses *crisis* or *crises* in his text. In total, *climate change* appears 39 times in the P-text, but only once in combination with *threat* (a quick search in the G-text revealed that Gore has not used *climate change* at all, in his text):

(45) Further progress in scientific assessment needs however to be achieved in order to support strong and adequate responses to the threats of climate change … (P, 30).

The implication is that Pachauri is referring to threats of the consequences of the climate change (ex. (44) above), whereas Gore is referring specifically to the threat of the climate change (ex. (37) and ex. (38) above).

4) Metaphors of illness

The health metaphors imply that someone is sick. When someone is sick, then someone else has to take care of him or her, and ideally, this someone would know what to do. The underlying conceptual metaphor is THE WORLD IS A PERSON (cf. Charteris-Black 2006: 179).

The G-text:

Gore talks about *the earth* as if it were a person, a sick person even, as in example (46):

(46) As a result, **the earth has a fever**. And **the fever is rising**. The experts have told us it is **not a passing affliction that will heal by itself**. We asked for **a second opinion**. And **a third**. And **a fourth**. And the consistent conclusion, restated with increasing alarm, is that **something basic is wrong**. (G, 11)

Now, *we* are presented as a caretaker, which is not quite willing to accept the responsibility, or the answers provided by *the experts*. The speaker implies a sense of denial.

In 4.5.4, I commented upon the speaker's strategy for not being perceived as an authority. This is visible in ex. (46) and ex. (47), where the speaker presents a clear distinction between *we*, including the speaker, and *the experts*. This allows the speaker to be quite direct in revealing 'our' faults and weaknesses, without being perceived as an authority.

Example (47) clearly expresses that the blame is 'ours'. Had the speaker used *you* instead of *we*, the result would have been an accusation, with the speaker as an authority and the audience as the responsible party.

(47) **We are** what is **wrong**, and **we must make it right**. (G, 12)

In these examples of potential illness metaphors, Gore evokes the images of a hospital. The *earth* is the patient, the scientists are the doctors, and *we* are the concerned caretakers, or parents, discussing with the doctors in the hospital corridor.

The P-text:

Pachauri also evokes images of a hospital and illness. In ex. (48), the *systems and communities* he mentions, are presented as a victim that suffers:

(48) Those systems and communities, which are **vulnerable, may suffer considerably** with even small changes in the climate at the margin. (P, 25)

Example (49) suggests that promising tests have been made earlier, but that the results were negative (*sterile*). Now, new tests are ready for analysis, and *hopes are alive* that they will *provide some positive results*:

(49) hopes are alive that unlike **the sterile outcome** of previous sessions in recent years, this one will provide some **positive results**. (P, 33)

It can be implied that the speaker had hopes that all the focus on climate change at the time would influence the outcome of the meeting.

Example (50) also suggests that there are some *vulnerable communities*, in contrast to *affluent societies*, that may not be in the *condition* to deal with the *climate-related threats*:

(50) and we cannot hide under global averages and the ability of affluent societies to deal with **climate-related threats** as opposed to **the condition of vulnerable communities** in poor regions of the globe. (P, 28)

By extension, the implied proposition is that the stronger, wealthier societies need to take care of, or at least consider the needs and abilities of, the weaker, poorer communities.

5) Life/creation vs. death/destruction

Ultimately, creation is good and destruction is bad. Presenting the situation as a choice between the two is a powerful move, as most people would agree that life/creation is the better option.

The G-text:

(51) **The very web of life** on which we depend **is being ripped and frayed**. (G, 15)

(52) In the last few months, it has been harder and harder to misinterpret the signs that **our world is spinning out of kilter**. (G, 15)

In ex. (51), the speaker presents the scenario of a life and death situation, and in ex. (52), *the signs that our world is spinning out of kilter* follows up on this. By extension, the speaker implies that if things do not change, *we* will destroy the foundations for our own existence.

This is a strategy for inducing *some* degree of fear in the audience, similar to fear appeals. The ultimate goal for the speaker is to convince the audience into thinking that by taking action we will reduce the danger.

The P-text:

In ex. (53) Pachauri presents a contrast between creation and destruction, as a comparison to what we might face. Civilizations, cultures, and societies have *flourished* and *blossomed* before they *crumbled*, *collapsed or faced chaos*.

(53) Much has been written, for instance, about the Maya civilization, which **flourished** during 250-950 AD, **but collapsed** largely as a result of serious and prolonged drought. Even earlier, some 4000 years ago a number of well-known Bronze Age cultures also **crumbled** extending from the Mediterranean to the Indus Valley, including the civilizations, which had **blossomed** in Mesopotamia. More recent examples of societies that **collapsed or faced chaos** on account of depletion or degradation of natural resources include the Khmer Empire in South East Asia, Eastern Island, and several others. (P, 6)

Pachauri's contributions in ex. (53) may evoke quite vivid images and a certain degree of fear in people, particularly if they perceive it as a likely fate and a believable comparison (see section 1.4.2.2).

The ideal fear appeal is one that persuades the recipient of the potential danger, but also convinces the recipient that s/he can do something to alleviate the threat. In ex. (54) Pachauri does include some encouraging suggestions:

(54) **There are multiple drivers for actions that reduce emissions of greenhouse gases**, and they **can produce multiple benefits at the local level** in terms of **economic development** and **poverty alleviation**, **employment**, **energy security**, and **local environmental protection**. (P, 23)

6) TIME IS A LIMITED RESOURCE

Time is money, and thus a valuable commodity in modern industrialised societies (Lakoff and Johnson 1980: 8-9). By extension, time is something that can also be wasted and lost.

The G-text:

(55) These prior struggles for survival were won when leaders found words **at the 11th hour** that released a mighty surge of courage, hope and readiness to sacrifice for a protracted and mortal challenge. (G, 27)

The 11th hour is the last possible moment that you can do something to prevent something bad from happening (Macmillan). This is one of Gore's references to previous wars, and it is likely that ex. (55) is intended to appeal to people's values and sense of morale also now. That is, the speaker wants to engage the recipients' pathos.

The likely effect is a sense of seriousness and danger. This analogy is probably included in the text because the speaker wants the audience to realize that we are now in the 11th hour of the climate crisis (see section 1.4.2.2). In addition, he seems to appeal to the hearers' personal values in order to convince them to do something that will demand a sacrifice. This may be called a 'moral frame' (cf. section 5.2.1.1).

The urgency in ex. (56) is a consequence of the image of the *crisis* as a vehicle in motion, which is gaining speed:

(56) **The pace of our response** must be **accelerated** to **match the accelerating pace** of the crisis itself. (G, 44)

What will happen if the *crisis* outruns us, or if it hits us at great speed? A pending collision provokes unpleasant images, so this potential metaphor is liable to cause a sense of stress and urgency.

The above examples are similar to fear appeals in that they suggest that time is a limited resource, which we are about to run out of. That is the equivalent to the threat information, and the efficacy information is the included suggestions that *courage, hope and readiness* and accelerated *pace* will help us to reduce the danger. Gore does utter a desire that the audience will listen, be convinced, and choose to act. Based on this, it is likely that the speaker will make use of his communicative skills to grasp the hearers' attention.

The P-text:

Pachauri does also suggest that we are pressed for time in the following example:

(57) We, therefore, have **a short window of time** to bring about a reduction in global emissions if we wish to limit temperature increase to around 2 °C at equilibrium. (P, 24)

Pachauri presents time as a window ajar, and it will only be open for a little while longer. Like in the G-text, this corresponds to a fear appeal, and the efficacy information is that we must reduce *global emissions*. Considering the point made by Weart about the IPCC (see sub-section 2 above), when Pachauri suggest that time is a limited resource, this constitutes a serious warning.

7) CONTAINER metaphors

Lakoff and Johnson note that we consider the world in terms of boundaries; we see the rest of the world as being outside of our own physical boundaries (1980: 29). We think of ourselves as containers, and project this structural orientation onto other physical items that are restricted by surfaces (ibid).

In the following examples, Gore projects this physical structural orientation onto something more abstract. As Lakoff and Johnson say, "even where there is no natural physical boundary that can be viewed as defining a container, we impose boundaries" (1980: 29):

(58) **The outer boundary** of what we currently believe is feasible **is still far short of** what we actually must do. (G, 52)

(59) That is just another way of saying that we have to **expand the boundaries** of what is possible. (G, 52)

Here Gore presents *what we currently believe is feasible* as a container that is too small to hold everything we need to put in it. We have to make the container bigger, because what we have set as the outer boundaries for our container is still inadequate in comparison to how big this container should be. Not even our thoughts and imagination (and current attempts) come close to what actually needs to be done.

Presenting *what we currently believe is feasible* as a container, makes it a territory, and by extension *our* territory, which *we* need to protect, expand, defend, cultivate etc.

The next example suggests that *we* and *the earth's climate* are trapped in a container, and we cannot move outside this container:

(60) Now, **we and the earth's climate are locked in** a relationship familiar to war planners: "Mutually assured destruction." (G, 22)

This example implies a conflict that none of us can win. Now, the situation is frozen, and the implication is that if the situation is to be solved, then one party, preferably we, will have to step outside the container. To be *locked in* suggests that progress has stopped. Technically, this is an overlap between a JOURNEY metaphor and a CONTAINER metaphor (Lakoff and Johnson 1980: 92).

8) Personifications as extensions of ontological metaphors

In addition to the above examples, the following examples are some of the potential metaphors that occur in the texts. Personifications function cognitively similar to metaphors in that they also "involve comparison of concepts or systems of concepts" (Sopory and Dillard 2002: 407). Lakoff and Johnson suggest they are extensions of ontological metaphors (1980: 34).

The future is a person/The present is a house

Personification picks out different sides of a person, or different ways of looking at a person (Lakoff and Johnson 1980: 34). In ex. (61) and (62) the future is presented as a person, thus equipping an abstract phenomenon with human characteristics and emotions:

(61) Sometimes, without warning, **the future knocks on our door** (G, 3)

(62) **The future is knocking at our door right now**. (G, 56)

Moreover, the future is presented as kind and friendly helper, like in the fairy tales, who comes to the hero's aid and helps him achieve his task. By extension, we are the hero in need,

with a task to complete. The personification of *the future* presents the idea that we have been lucky to receive a glimpse of *what might be* and, having foreseen a possible catastrophic future, we can now change it.

This is an interesting strategy presented by Gore. When given the opportunity, who would not like to change the future when it is presented as *a planetary emergency* and the worse option of two choices (cf. ex. (28) above). Furthermore, this emergency is in effect presented as approaching our own house.

Our door creates the sense of a common household. If successful, the metaphor may stir the idea that in a household, everybody contributes to the common good. In addition, a house demands maintenance, and as members of the household we all share this responsibility. Again, the speaker invokes the frame of 'global collaboration' (cf. sections 5.2.1.1 and 5.2.1.2).

Examples (61) and (62) reveal a few of the many strategies Gore applies, or rather, potential strategies that result of the speaker's choices. These strategies intend to encourage global action. As mentioned at the beginning of section 5.5, the speaker's conscious choices do not necessarily reflect the metaphorical potential of the language he uses. Similarly, Gore might not have consciously intended that *we* represent a hero in need, however, all the occurrences of inclusive *we* in his text (see section 4.5.2), and *our* in the above examples, does signal that the speaker wants to create solidarity and encourage global cooperation (see also section 4.2.2).

A nation is a person

In ex. (63), Pachauri focuses on family, human fertility and reproduction.

(63) Coming as I do from **India, a land which gave birth** to civilization in ancient times (P, 5)

This personification of India brings to mind concepts like creation, life, and family. The speaker is in fact calling India the mother of the ancient civilization, and by extension, the following generations owe their existence to her. In addition, this presents the view of a united world, a 'global collaboration frame' or the world is one family (cf. ex. (13) in section 5.2.1.2 above).

Science is a person

By personification in ex. (64) Pachauri focuses on the capacity of a human's voice:

(64) Will those responsible for decisions in the field of climate change at the global level listen to **the voice of science and knowledge, which is now loud and clear**? (P, 33)

This is a tribute to science. Firstly, scientific research has produced significant results, which deserve the world's attention. Secondly, *science and knowledge* signify a strong character with a strong voice. Both points help construct an ethos around science and knowledge, so to say: The example ascribes the person admirable qualities of diligence, dedication, and intelligence.

Example (64) is from the final paragraph in the P-text, and eloquently, it sums up the communicative goal of the speaker. Having presented his text, with a short summary of the Fourth Assessment Report, this question emphasises the importance of the work of the IPCC, and the importance of knowledge about the climate change.

5.5.2 Observations on metaphors in the two texts

As the above examples have illustrated, a speaker can highlight particular aspects of a situation or a concept by means of metaphors. Metaphors, if indeed their possible meaning potential is fulfilled and perceived, may also have similar effects on people as fear appeals.

Of the potential metaphors found in the two texts, both speakers make use of journey metaphors, illness metaphors, the contrast between life/creation and death/destruction, and metaphors of time. In addition, Gore makes use of container metaphors, and war metaphors, and Pachauri presents the climate change as an adversary.

Several of Gore's metaphors are concerned with evoking responsibility. He evokes moral responsibility by presenting the climate changes as a threat we have to face; he presents the audience with the responsibility of a caretaker nursing a sick planet; and, he presents our beliefs as a container, thus, a territory we have the responsibility to administer. This is compatible to the style of his text as demonstrated in the modality analyses. Gore's strategy of using inclusive *we*, as illustrated in chapter 4, and the illness metaphors presented above create an 'in-group' of speaker and hearer. In addition, the illness metaphors present a categorisation of 'the experts' and 'we', which conveys the speaker's acknowledgement of scientific evidence.

This analysis highlighted some interesting features in the P-text, for instance, Pachauri uses metaphors of illness to highlight the difference between economically weak and strong

societies. By extension, he emphasises that the wealthier societies have a responsibility to the more vulnerable societies. Furthermore, climate change is presented as an adversary against whom we have to protect ourselves. Through a contrast between creation and destruction, Pachauri introduces a link between our society and previous societies that have blossomed, faced chaos, and collapsed. Personifications call to mind images of family, and construct a solid, dedicated, and hard-working character around *science and knowledge*. Pachauri also indicates that time is limited and suggests that unless we deal with the climate change now this *challenge* will only grow bigger.

Both speakers present their messages in a 'global collaboration frame', and emphasis is placed on the need for *affluent societies* to support more *vulnerable systems and communities*. In addition, both speakers express their respect for scientific knowledge.

5.6 Concluding remarks

As mentioned above, this has not been an exhaustive analysis of all the message factors in the two texts. Thus, it is difficult to say whether the patterns that are revealed here are applicable to the texts as a whole. That is, other potential metaphors and types of personification may appear in an exhaustive analysis of the two texts. However, this study has revealed some of the strategies, and potential strategies the speakers apply.

Gore balances fear, values, responsibility, and urgency. He uses different methods to convince his audience of their, and his, responsibility. He does this by way of evidence, metaphors and by means of expressing obligation and necessity. Because of his expression of moral responsibility and willingness to face the challenge, the speaker's ethos, or ethical qualities, is likely to increase. With the quote from Henrik Ibsen, Gore highlights the responsibility this generation has towards future generations, thus introducing a 'legacy frame'. He induces speaker/hearer responsibility also by means of metaphors. For instance, Gore evokes a 'global collaboration frame' when he suggest that the present generation shares a house. He also expresses the necessity of making a choice.

Pachauri evokes the notion of family by means of personification. He also pays tribute to science and knowledge, and honours the work and dedication that has gone into producing the Fourth Assessment report. Like Gore, Pachauri uses a 'global collaboration frame', for instance when he introduces the ancient Hindi philosophy. As mentioned in section 5.2, this philosophy is similar to the idea of a 'global village'.

Both speakers borrow authority from the sources they include. They use these additional voices to emphasise the seriousness of the situation. Some of the quotes function partly as fear appeals, but mostly, a sense of fear and danger is evoked by evidence, metaphors and through the contents of the messages discussed in the modality analysis in chapter 4. The results of the consideration of fear appeals are probably not representative of the texts, as the restrictions applied to what this paper considered as fear appeals limited the data for analysis.

As noted in the introduction to this chapter, this analysis did not aim to explain any persuasive effects of the texts. However, it proved impossible to avoid completely a consideration of persuasive potential when discussing the message factors and the sources. As noted in section 4.8, Gore's text has a persuasive function and this chapter has proved that some of the metaphors in both texts resemble the qualities of fear appeals. Fear appeals, as mentioned, evoke people's sense of fear if successful. In this lies their persuasive potential. Thus, I will emphasise that also Pachauri's text contain persuasive potential.

All of the message factors and the sources discussed here convey the speakers' personality and stance (ethos) towards their presentation. Both speakers reveal that they are dedicated to the task, which is to express information in a manner that fits their intended purpose. As mentioned in chapter 1, both speakers are dedicated to communicating climate change in order to increase awareness, and to encourage rational and urgent action. The examples and discussions in chapter 4 and 5 illustrate that as different as their communicative strategies are, their commitment to the task is (equally) great.

6: Conclusion

This study set out to investigate how the two Laureates communicate their message(s) in the light of their communicative goals, and of particular interest was how they communicate the complex issue of climate change. I suggested a common communicative goal for the two speakers, which was summarised in chapter 1 in the following proposition, *rational, sufficient, and urgent global collaboration is necessary to meet the challenges of climate change*. Thus, I suggested that the speakers' communicative goal was to present information that will increase the audience's understanding and lead to commitment to action. Furthermore, I suggested that the speakers have adopted different communicative strategies to reach this communicative goal.

In order to reach these objectives, I performed two separate yet complementary analyses with the intention of highlighting some of the different features that contribute to fulfilling speakers' communicative goals, and, by extension, contribute to the differences between the texts. The results of the analyses were presented and discussed in chapters 4 and 5. The results were summarised in detail at the end of each subsection, and conclusions were drawn at the end of each chapter.

In chapter 4, the study considered modality in order to investigate the speakers' attitudes towards their message(s). This part of the analysis focused on the clause as exchange between speaker and hearer. In chapter 5, the analysis focused on the message factors to consider some of the communicative strategies the speakers have adopted. In that chapter, the focused turned from the clause to the message, and a consideration of language use in the exchange between speaker and hearer.

One problematic issue concerning the communication of climate change involves the complexities of the underlying science. In order to reach the audience, it is necessary to present the information in a comprehensible manner. Chapter 3 presented two studies which both suggest that the issue of climate change is complex and difficult to understand. The latter of these studies (Maibach et al. 2008) proposed communicative strategies that may prove effective for communicating the climate changes in a comprehensible manner. They suggest for instance fear appeals, framing and metaphors – and they propose that the discourse on

climate change is (still) in need of an effective and summarising metaphor. In addition, they suggest that descriptions of projected impacts of climate change should be tailored to suit the audience, in terms of geographical proximity, values, and interests, etc. These studies provided an underlying focus for the discussions of the communication of the speakers' goal in chapters 4 and 5. The present study did not attempt to perform an exhaustive analysis of all of the suggested communicative strategies. However, the metaphor analysis did reveal that both speakers have included potential illness metaphors, journey metaphors, and metaphors of time, which highlights the danger, the challenges and the urgency related to the climate change.

The methodology

It remains to consider whether the two approaches have succeeded in reaching the objectives of this study. The methodological framework outlined in chapter 2 allowed for the expression of modality in more than one position in a clause. The approach adopted made necessary a careful explanation of terminology and the extension of the framework. One consequence of adapting Quirk et al.'s (1985) terminology was that some concepts like 'modal metaphor', the modal meaning of usuality, and the degrees of low, median, and high modal value, had to be adopted from Halliday (1994). Thus, it is relevant to ask whether it was in fact necessary to combine the two frameworks at all. What Quirk et al. (1985) contribute to this study is mainly the terminology and an easy classification of single word verbs, multi-word verbs and content disjuncts, while Halliday's approach opens for a wide consideration of modality, and is thus well suited for the study of modal meaning in communication. Once the difficulties of combining two such frameworks had been overcome, the combination proved useful in the discussion in chapter 4, as some interesting strategies for modal expressions were revealed.

The methodology opened up for a comprehensive understanding of modality in the two texts, and a feature that received attention through this approach was the modal metaphors discussed in chapter 4, which were applied by both speakers (Gore: *it should be absolutely clear that* (…); and Pachauri: *it would be* (*particularly*) *relevant to* (…)). They allow the speakers to express an opinion without explicitly claiming modal responsibility.

Another feature that was particularly frequent in Pachauri's lecture was the speaker's strategy for expressing prediction by means of semi-auxiliaries (an expansion of the predicator, cf. Halliday 1994, also section 2.3.2). Its impact on the speech is an impersonal communicative style, which is also a typical feature of scientific language (cf. Halliday 1993). The framework

made it possible to consider these similarities and differences in the speakers' communicative strategies for expressing modality. These two features reveal the primary differences between the two texts. Gore presents a text which shows a high degree of speaker involvement, speaker commitment and interacting with the audience. Pachauri has adopted a mainly impersonal communicative style, which is a result of such features as modal metaphors and explicit objective expressions of modality.

Both texts convey an overarching sense of warnings and urgency, which was discussed in chapter 4, and in more detail in chapter 5. Yet, as both chapters revealed, it varies how explicit the speaker allows himself to be. My discussions in chapters 4 and 5 revealed the speakers' stance, or tone, towards the topics of discussion (ethos). In addition, they revealed the speaker's attempt at appealing to the audiences' emotions (pathos). The examples and discussions in chapter 4 and 5 illustrate that as different as their communicative strategies are, their commitment to the task is profound.

The analytical approaches adopted in this study have focused on speaker involvement, speaker commitment, and interpersonal communicative strategies, and have thus made it possible to identify and explain some of the differences, and similarities, between the texts and the speakers. The context allowed for a comparison of the speaker variable, as the occasion is the same for both speakers and the topic content is the same.

Gore

The relatively few occasions where Gore adopted a more impersonal style was as he expressed his opinions about what governments should do. The level of certainty in these examples was weaker, compared to when he expressed his opinions concerning necessary actions and what *we* must do. By using inclusive *we*, Gore presents a 'global collaboration frame' and focuses on the necessity for creating opportunities for people in countries with limited resources.

Chapter 4 demonstrated how Gore focuses on responsibility, obligation, and urgency through modality and hypothetical meaning. A discussion of Gore's choice of responsible Subject in his text, and his use of necessity and obligation, showed that Gore encourages the public, *and* governments, to take responsibility. I also suggested in chapter 4 that the application of inclusive *we* in the G-text is used by the speaker to identify with the hearers. This tactic

makes a proposition come across as less demanding, it makes a command sound less authoritative, and it includes and engages the audience.

Chapter 5 illustrated that Gore appeals to the audience's fears, courage, determination, and sense of responsibilities in order to reach his communicative goal. I suggested that Gore present the climate changes as a *threat* and an adversary to evoke fear. Potential metaphors in Gore's text add emphasis to the messages, as they provide an additional focus, and ease comprehension of his messages. This is presumably because he wants as many people as possible to understand why it is necessary to take action.

By use of metaphors, Gore presses on the audience's sense of responsibility to protect, defend, and care for the planet. He does this by means of presenting the planet as a sick person, the climate changes as a threat, and our beliefs as our own container, which we need to expand. I suggested that the speaker applies a 'legacy frame', to encourage the audience to commit to action that will secure the future for coming generations. Through a focus on moral responsibility and the personal gains we can achieve by stepping up to, and facing, the threat, Gore attempts to encourage and persuade people to commit to a complicated, demanding, and costly challenge. Furthermore, a very brief comparison suggested that Gore's communicative style shares features of the communicative style of Martin Luther King Jr.

Gore does not get into the details of technical scientific explanations, rather, he mentions them briefly and attributes *science,* or some unspecified *scientists* as the source of information. Based on the analyses in chapters 4 and 5, it is clear that the rhetorical function (mode) of Gore's lecture is a persuasive text rather than an expository or a didactic text.

Pachauri

Pachauri's text reveals a low degree of speaker commitment and subjective modal responsibility. The speaker presents an informational and technical text, and the rhetorical function of the text is expository rather than persuasive. Some of the more technical parts of Pachauri's text correspond to what Sterman and Sweeney (2007) and Maibach et al. (2008) point to when they suggest that the discourse of climate change is difficult to understand for non-scientists. Pachauri's text is informative, and occasionally, definitely more often than Gore's text, it demands a higher level of familiarity with technical terminology and the underlying science. The result is a text that may be occasionally difficult to understand as it contains many technical expressions and explanations, hypothetical scenarios, and tentative

projections about expected impacts of climate change. The restrictions that apply for Pachauri because of his role as Chair of the IPCC have been commented upon in chapters 1 and 4.

In chapter 4, I illustrated how Pachauri's communicative style creates distance between message and speaker in that the modally responsible Subject was often not immediately obvious. Consequently, the focus was consistently more on the message than on the speaker or the hearer. This creates a distance between speaker and hearer, as the hearers are allocated the role of passive receivers of information. Furthermore, the presentation in chapter 4 also revealed that Pachauri provides several tentative warnings and assessments of responsible actions. Like Gore, Pachauri focuses on responsibility and global collaboration as a necessary plan of action. He evokes a Hindi philosophy, and the idea of a global village, and thus in an indirect way, Pachauri reveals some personal opinions in a communicative style that is compatible with the rest of the text. Pachauri's text reveals the speaker's view that information and knowledge are important when it comes to the issue of climate change. Pachauri postulates it on several occasions in his speech (see e.g. section 5.5.1).

In chapter 5, I suggested that Pachauri applied metaphors to emphasise that there are strong and weak societies, and that the more affluent societies have a responsibility to protect the more vulnerable regions and communities. Through evidence, in particular the eyewitness statements/narrative reports from President Gayoom, Pachauri highlighted that we do not have much time. By means of evidence and personification of India, the speaker warns that the problems are already evident in some places, and he expresses a need for global collaboration. I suggested that by including the reference to the philosophy of "Vasudhaiva Kutumbakam" Pachauri reveals his personal opinion. I also commented that the speaker expressed urgency, as threat will only increase in size the longer we wait.

The lecture as a genre – differences between the texts

Chapter 1 introduced a definition of 'lecture' by Goffman (1981). According to this definition, and the results of the present study, Pachauri's text fits in the serious and slightly impersonal style of a 'normal lecture', whereas Gore's text has sermon-like qualities. The focal point in Gore's text is not so much to honour and celebrate, but rather to warn and encourage, appeal to morality, provide an emotional impact and to encourage immediate action. The focal point in Pachauri's text is to inform in a serious and calm manner, in order to generate understanding. This study has thus revealed that the texts differ in terms of sub-genre. In terms of adhering to the genre conventions, and in terms of communicating their

communicative goals in a manner of their choice, however, both speakers and texts are equally successful.

Further research

This study has yielded some interesting results in terms of similarities and differences between two speakers' approaches to the same objective. However, because of the small amount of data, it is difficult to make valid comparisons between this study and other studies on metaphors (e.g. Lule 2003, Charteris-Black, 2006) and modality in speeches (e.g. Stenbakken 2007). This is also a consequence of the fact that there seems to be little research on such texts as the Nobel Lectures. The Nobel Lectures provide a solid foundation for comparison between speakers and texts, on the occasions where more than one person is awarded the prize, as the field and mode are the same for both speakers and texts, while the tenor, in terms of speaker, is different. Such lectures are also interesting, as the Laureates come from such diverse backgrounds.

Further research could consider interactional and informational themes in these two texts (cf. Berry 1995). An exhaustive analysis of metaphors, personification, metonymy, and other rhetorical features could highlight further aspects of how the speakers have chosen to communicate their communicative goals. It could also be interesting to consider, for educational purposes, what constitutes a 'good strategy' for communicating climate change.

References

Primary data

Gore, A. A. (2007) "Lecture given by the Nobel Peace Prize Laureate 2007", December 10, 2007, Oslo. © THE NOBEL FOUNDATION 2007. Available from URL: http://nobelpeaceprize.org/en_GB/laureates/laureates-2007/gore-lecture/ (Accessed: December 12, 2007).

Pachauri, R. K. (2007) "Lecture given by the Nobel Peace Prize Laureate 2007", IPCC, represented by R. K. Pachauri, December 10, 2007, Oslo. © THE NOBEL FOUNDATION 2007. Available from URL: http://nobelpeaceprize.org/en_GB/laureates/laureates-2007/ipcc-lecture/ (Accessed: December 12, 2007).

Works cited

bbc.co.uk.

1. Information on Winston Churchill. Available from URL: http://www.bbc.co.uk/history/historic_figures/churchill_winston.shtml (Accessed: April 7, 2009).

2 Information on George Orwell. Available from URL: http://www.bbc.co.uk/history/historic_figures/orwell_george.shtml (Accessed: April 7, 2009).

Bhatia, A. (2007) "Religious Metaphor in the Discourse of Illusion: George W. Bush and Osama bin Laden", in *World Englishes*. Vol. 26, no. 4. The Author Journal Compilation. Oxford: Blackwell Publishing Ltd, pp. 507-524.

Biber, D., S. Johansson, G. Leech, S. Conrad, and E. Finegan (2006) *Longman Grammar of Spoken and Written English* (5th impression). Harlow: Longman.

Bradley, O. (1948, June 14) "By the stars", in Time Magazine. The full quote is; *The United States has matured to world leadership; it is time we steered by the stars, not by the lights of each passing ship*. Available from URL: http://www.time.com/time/magazine/article/0,9171,854866,00.html (Accessed: March 10, 2009).

Brunvoll, K. (1992) “Communicative Structures in Five Speeches by Martin Luther King”. A thesis presented to the Department of British and American Studies, spring 1992, the University of Oslo.

Charteris-Black, J. (2006) *Politicians and Rhetoric: The Persuasive Power of Metaphor*. Basingstoke: Palgrave Macmillan.

Coates, J. (1983) *The Semantics of the Modal Auxiliaries*. London; Canberra: Croom Helm.

Cockroft, R. and S. M. Cockroft, (1992) *Persuading People: An introduction to Rhetoric*. Basingstoke: Macmillan.

Davies, E. (2001) “Propositional Attitudes”, in *Functions of Language*. 2002. Vol. 8, no. 2. Amsterdam; Philadelphia: John Benjamins Publishing Company, pp. 217-251.

Fairclough, N. (2001) *Language and Power* 2nd ed. Harlow; London: Longman.

Goffman, E. (1981) *Forms of Talk*. Philadelphia: University of Pennsylvania Press.

gotquestions.org. Information about the Book of Deuteronomy. Available from URL: http://www.gotquestions.org/Book-of-Deuteronomy.html (Accessed: April 7, 2009).

Halliday, M.A.K. (1993) “Some Grammatical Problems in Scientific English”. In Halliday, M.A.K. and J. Martin (eds.) *Writing Science*. University of Pittsburgh Press, pp. 69–85.

Halliday, M. A. K. (1994) *An Introduction to Functional Grammar* 2nd ed. London: Edward Arnold.

Halliday M. A. K. (2002) *Linguistic Studies of Text and Discourse*. Webster, J. (ed.). London: Continuum.

Hauser C. and A. O’Connor (2007, April 16) “Virginia Tech Shooting Leaves 33 Dead”, in nytimes.com. Available from URL: http://www.nytimes.com/2007/04/16/us/16cnd-shooting.html (Accessed: March 9, 2009).

Hillier, H. (2004) Analysing Real Texts: Research Studies in Modern English Language. London: Palgrave Macmillan.

Hyland, K. (1999) “Academic Attribution: Citation and the Construction of Disciplinary Knowledge” in *Applied Linguistics*. Vol. 20, no. 3, pp: 341-367. Available from URL <http://applij.oxfordjournals.org/cgi/reprint/20/3/341> (Accessed: February 27, 2009).

ipcc.ch. The official website of The Intergovernmental Panel on Climate Change. Available from URL: http://www.ipcc.ch/.

1. Information about Rajendra K. Pachauri. Available from URL: http://www.ipcc.ch/pdf/press/briefcv_pachauri.pdf (Accessed: April 23, 2009).

2. Mandate of the IPCC. Available from URL: http://www.ipcc.ch/about/index.htm> (Accessed: June 17, 2008).

3. Information about the organization of IPCC, Available from URL: http://www.ipcc.ch/about/how-the-ipcc-is-organized.htm (Accessed: April 24, 2009).

King, M. L. (1964) "The Quest for Peace and Justice" Nobel Peace Prize Lecture, December 11, 1964, the Auditorium at the University of Oslo. Available from URL: http://nobelprize.org/nobel_prizes/peace/laureates/1964/king-lecture.html (Accessed: April 18, 2009).

Kühle-Gotovac, D. (2008) Head of administration at the Norwegian Nobel Institute. E-mail concerning the type of information the Nobel Laureates receive from the Norwegian Nobel Institute, received September 23, 2008.

Lakoff, G. and M. Johnson (1980) *Metaphors we live by*. Chicago; London: The University of Chicago Press.

Lakoff, G. (2008) "The Neural Theory of Metaphor" *The Cambridge Handbook of Metaphor and Thought*, Gibbs, R. W. (ed.), Cambridge: Cambridge University Press, pp. 17-38.

lucidcafe.com. Information on Mahatma Gandhi. Available from URL: http://www.lucidcafe.com/library/95oct/mkgandhi.html (Accessed: April 7, 2009).

Lule, J. (2004) "War and its Metaphors: News Language and the Prelude to War in Iraq, 2003", *Journalism Studies*. 2004, Vol. 5, no. 2, pp. 179-190. Available from URL <http://dx.doi.org/10.1080/1461670042000211168> (Accessed: September 7, 2007).

Macmillan Dictionary, available from URL: http://www.macmillandictionary.com/ © Macmillan Publishers Limited 2009.

Maibach, E. W., C. Roser-Renouf, and A. Leiserowitz (2008) "Communication and Marketing as Climate Change – Intervention Assets: a Public Health Perspective" in *American Journal of Preventive Medicine*. 2008, Vol. 35, no. 5, pp. 488-500. Available from URL: http://www.bvsde.paho.org/bvsacd/cd68/EMaibach.pdf (Accessed: May 2, 2009).

Martin, J. R. and D. Rose (2003) *Working with Discourse: Meaning Beyond the Clause*. London: Continuum.

McLuhan, M., and Q. Fiore (1968) *War and Peace in the Global Village*. Produced by J. Agel, Simon & Schuster Inc., New York.

MED (2007) *Macmillan English Dictionary for Advanced Learners*, 2nd ed. Oxford: Macmillan and A&C Black Publishers Ltd.

Mjøs, O. D., (2007, December 10) “Presentation speech”, Available from URL: http://nobelpeaceprize.org/en_GB/laureates/laureates-2007/presentation-2007 (Accessed: July 1, 2008).

Moreno-Ocampo, L. (2009) “International Criminal Court ‘Working to Protect African Victims’”. Available from URL: http://www.amnesty.org/en/news-and-updates/feature-stories/international-criminal-court-working-protect-african-victims-20090305 (Accessed: March 9, 2009).

Nobelpeazeprize.org. The official web site of the Norwegian Nobel Institute. Available from URL: http://nobelpeaceprize.org/

1. Information on the award ceremony and the audience. Available from URL: http://nobelpeaceprize.org/en_GB/about_peaceprize/award_ceremony/ (Accessed: April 22, 2009).
2. Information on the nomination of the 2007 Nobel Peace Prize Laureates. Available from URL: http://nobelpeaceprize.org/en_GB/laureates/laureates-2007 (Accessed: May 10, 2009)

Nobelprize.org. The official web site of the Nobel Foundation. Available from URL: http://nobelprize.org/ Copyright © Nobel Web AB 2009.

1. Information on all Nobel Laureates, Available from URL: http://nobelprize.org/nobel_prizes/lists/all/ (Accessed: February 26, 2009).
2. Information on Berge Furre. Available from URL: http://nobelprize.org/nobel_prizes/peace/articles/committee/nnclist/index.html (Accessed: April 7, 2009).
3. Information on Willy Brandt. Available from URL: http://nobelprize.org/nobel_prizes/peace/laureates/1971/brandt-cv.html (Accessed: March 10, 2009).
4. Information on Svante Arrhenius. Available from URL: http://nobelprize.org/nobel_prizes/chemistry/laureates/1903/arrhenius-bio.html (Accessed: April 7, 2009).

Oxford English Dictionary. OED.com online, available from URL: http://www.oed.com/

Palmer, F. R. (1990) *Modality and the English Modals*, 2nd ed. London: Longman.

Perloff, R. M. (2003) *The Dynamics of Persuasion: Communication and Attitudes in the 21st Century*, 2nd ed. London: Lawrence Erlbaum Associates Inc.

Pollack, A. (2009, March 11) “Stem Cell Decision Worries Some Scientists”, from nytimes.com Available from URL:

http://www.nytimes.com/2009/03/11/health/policy/11stem.html?_r=1&hp (Accessed: March 11, 2009).

Pragglejaz Group (2007) "MIP: A Method for Identifying Metaphorically used Words in Discourse", in *Metaphor and Symbol* vol. 22, no. 1, pp. 1-39, from informaworld. Available from URL: http://www.informaworld.com/smpp/section?content=a787952726&fulltext=713240928 (Accessed: November 20, 2008).

Quirk, R. S. Greenbaum, G. Leech and J. Svartvik (1985) *A Comprehensive Grammar of the English Language*. London: Longman.

Revkin, A. C. (2007, October 13) "2 Winners, and 2 Approaches to Spreading the Word on Climate", from nytimes.com. Available from URL: http://www.nytimes.com/2007/10/13/science/13climate.html (Accessed: July 1, 2008).

Robb, T. (2007, April 17) "Could an Armed Student Body have Saved the Day at Virginia Tech?" Available from URL: http://www.kkk.bz/Press%20Releasvirgtechshooting.pdf (Accessed: March 9, 2009).

Semino, E. (2008) *Metaphor in Discourse*. Cambridge: Cambridge University Press.

Smokefree.gov (2000) "Reducing Tobacco Use: A Report of the Surgeon General" from http://www.smokefree.gov/. Available from URL: http://www.smokefree.gov/quit-smoking/in_cigarette.html (Accessed: March 6, 2009).The Web site was created by the Tobacco Control Research Branch of the National Cancer Institute.

Sopory, P. and J. P. Dillard (2002) "Figurative Language and Persuasion" in J. P. Dillard and M. Pfau (eds.) *The Persuasion Handbook: Developments in Theory and Practice*. London and New Delhi: Sage Publications; Thousand Oaks, pp. 407-426.

Stenbakken, A. T. A. (2007) "What Makes a Politician Persuasive? A Study of Ideology, Rhetoric and Modality in Speeches by Tony Blair and George W. Bush". A thesis presented to the Department of Literature, Area Studies and Language, autumn 2007, the University of Oslo.

Sterman, J. D. and L. B. Sweeney (2007) "Understanding Public Complacency about Climate Change: Adults' Mental Models of Climate Change Violate Conservation of Matter", in *Climate Change*, (received August 8, 2004), February 2007, Vol. 80, no. 3-4, pp. 213-238. DOI: 10.1007/s10584-006-9107-5. Available from URL: http://www.springerlink.com/content/f367413412565006/ (Accessed: May 2, 2009).

Thomas, E. R., G. J. Marshall, and J. R. McConnell (2008) "A Doubling in Snow Accumulation in the Western Antarctic Peninsula since 1850", in *Geophysical*

Research Letters, 35, L01706, doi:10.1029/2007GL032529. Available from URL: http://www.worldclimatereport.com/index.php/2008/01/21/antarctica-snowfall-increase/#more-301 (Accessed: February 25, 2009).

Thompson, G. (2004) *Introducing Functional Grammar*, 2nd ed. London: Hodder Arnold.

unfccc.int. Information on the United Nations Climate Change Conference in Bali December 3-15, 2007. Available from URL: http://unfccc.int/2860.php (Accessed: March 10, 2009).

Weingart, P., A. Engels and P. Pansegrau (2000) "Risk of Communication: Discourse on Climate Change in Science, Politics and the Mass Media" in *Public understanding of science*. Vol. 9, pp. 261-283. Sage Publications. Available from URL: http://pus.sagepub.com/cgi/content/abstract/9/3/261 (Accessed: August 29, 2008).

Zimmer, B. (2007, December 13) "From 'Nuclear Winter' to 'Carbon Summer'" from OUP blog © Copyright Oxford University Press, USA 2006-2008. Available from URL: http://blog.oup.com/2007/12/carbon_summer/ (Accessed: March 10, 2009).

Appendix 1

Excerpts from the Nobel Lecture given by The Nobel Peace Prize Laureate 2007, Al Gore (Oslo, December 10, 2007) © THE NOBEL FOUNDATION 2007. [11]

(G20) We also find it hard to imagine making the massive changes that are now necessary to solve the crisis. And when large truths are genuinely inconvenient, whole societies can, at least for a time, ignore them. Yet as George Orwell reminds us: "Sooner or later a false belief bumps up against solid reality, usually on a battlefield."

(G38) When we unite for a moral purpose that is manifestly good and true, the spiritual energy unleashed can transform us. The generation that defeated fascism throughout the world in the 1940s found, in rising to meet their awesome challenge, that they had gained the moral authority and long-term vision to launch the Marshall Plan, the United Nations, and a new level of global cooperation and foresight that unified Europe and facilitated the emergence of democracy and prosperity in Germany, Japan, Italy and much of the world. One of their visionary leaders said, "It is time we steered by the stars and not by the lights of every passing ship."

(G39) In the last year of that war, you gave the Peace Prize to a man from my hometown of 2000 people, Carthage, Tennessee. Cordell Hull was described by Franklin Roosevelt as the "Father of the United Nations." He was an inspiration and hero to my own father, who followed Hull in the Congress and the U.S. Senate and in his commitment to world peace and global cooperation.

(G53) That is just another way of saying that we have to expand the boundaries of what is possible. In the words of the Spanish poet, Antonio Machado, "Pathwalker, there is no path. You must make the path as you walk."

Excerpts from the Nobel Lecture given by The Nobel Peace Prize Laureate 2007, Intergovernmental Panel on Climate Change (IPCC), represented by R K Pachauri, Chairman (Oslo, December 10, 2007) © THE NOBEL FOUNDATION 2007.

(P6) Neglect in protecting our heritage of natural resources could prove extremely harmful for the human race and for all species that share common space on planet earth. Indeed, there are many lessons in human history which provide adequate warning about the chaos and destruction that could take place if we remain guilty of myopic indifference to the progressive erosion and decline of nature's resources. Much has been written, for instance, about the Maya civilization, which flourished during 250-950 AD, but collapsed largely as a result of serious and prolonged drought. Even earlier, some 4000 years ago a number of well-known Bronze Age cultures also crumbled extending from the Mediterranean to the Indus Valley, including the civilizations, which had blossomed in Mesopotamia. More recent examples of societies that collapsed or faced chaos on account of depletion or degradation of natural resources include the Khmer Empire in South East Asia, Eastern Island, and several others. Changes in climate have historically determined periods of peace as well as conflict. The recent work of David Zhang has, in fact, highlighted the link

[11] Permission to include excerpts from the 2007 Nobel Peace Prize Lectures granted by the Nobel Foundation. © THE NOBEL FOUNDATION 2007. The Lectures are available from URLs:
http://nobelpeaceprize.org/en_GB/laureates/laureates-2007/gore-lecture/
http://nobelpeaceprize.org/en_GB/laureates/laureates-2007/ipcc-lecture/

between temperature fluctuations, reduced agricultural production, and the frequency of warfare in Eastern China over the last millennium. Further, in recent years several groups have studied the link between climate and security. These have raised the threat of dramatic population migration, conflict, and war over water and other resources as well as a realignment of power among nations. Some also highlight the possibility of rising tensions between rich and poor nations, health problems caused particularly by water shortages, and crop failures as well as concerns over nuclear proliferation.

(P7) One of the most significant aspects of the impacts of climate change, which has unfortunately not received adequate attention from scholars in the social sciences, relates to the equity implications of changes that are occurring and are likely to occur in the future. In general, the impacts of climate change on some of the poorest and the most vulnerable communities in the world could prove extremely unsettling. And, given the inadequacy of capacity, economic strength, and institutional capabilities characterizing some of these communities, they would remain extremely vulnerable to the impacts of climate change and may, therefore, actually see a decline in their economic condition, with a loss of livelihoods and opportunities to maintain even subsistence levels of existence. Since the IPCC by its very nature is an organization that does not provide assessments, which are policy prescriptive, it has not provided any directions on how conflicts inherent in the social implications of the impacts of climate change could be avoided or contained. Nevertheless, the Fourth Assessment Report provides scientific findings that other scholars can study and arrive at some conclusions on in relation to peace and security. Several parts of our reports have much information and knowledge that would be of considerable value for individual researchers and think tanks dealing with security issues as well as governments that necessarily are concerned with some of these matters. It would be particularly relevant to conduct in-depth analysis of risks to security among the most vulnerable sectors and communities impacted by climate change across the globe.

Appendix 2

Table 4.7: Semi-auxiliaries expressing prediction in the P-text

1 (P, 22)	But, adaptation alone **is not expected to** cope with all the projected effects of climate change, and especially not in the long run as most impacts increase in magnitude.
2 (P, 8)	In this regard, climate change will have several implications, as numerous adverse impacts **are expected** for some populations in terms of: (…)
3 (P, 11)	The health status of millions of people **is projected to** be affected through for example, increases in malnutrition; increased deaths, diseases, and injury due to extreme weather events; increased burden of diarrhoeal diseases; increased frequency of cardio-respiratory diseases due to higher concentrations of ground-level ozone in urban areas related to climate change; and the altered spatial distribution of some infectious diseases.
4 (P, 10)	Climate change could further adversely affect food security and exacerbate malnutrition at low latitudes, especially, especially in seasonally dry and tropical regions, where crop productivity **is projected to** decrease for even small local temperature increases (1-2 °C).
5 (P, 9)	Widespread mass losses from glaciers and reductions in snow cover over recent decades **are projected to** accelerate throughout the 21st century, reducing water availability, hydropower potential, and the changing seasonality of flows in regions supplied by meltwater from major mountain ranges (e.g. Hindu-Kush, Himalaya, Andes), where more than one-sixth of the world's population currently lives.
6 (P, 10)	Agricultural production, including access to food, in many African countries **is projected to** be severely compromised.
7 (P, 12)	There is medium confidence that approximately 20%-30% of species assessed so far **are likely to** be at increased risk of extinction if increases in global average warming exceed 1.5-2.5 °C, relative to 1980-99.
8 (P, 12)	Climate change **is likely to** lead to some irreversible impacts on biodiversity.
9 (P, 7)	One of the most significant aspects of the impacts of climate change, which has unfortunately not received adequate attention from scholars in the social sciences, relates to the equity implications of changes that are occurring and **are likely to** occur in the future.

Table 4.11: Examples with *we* + *must* expressing necessity ↔ obligation in the G-text

1) (G, 27)	**We** must quickly mobilize our civilization with the urgency and resolve that has previously been seen only when nations mobilized for war.
2) (G, 37)	**We** must ensure that entrepreneurs and inventors everywhere on the globe have the chance to change the world.
3) (G, 35)	**We** must abandon the conceit that individual, isolated, private actions are the answer.
4) (G, 42)	**We** must begin by making the common rescue of the global environment the central organizing principle of the world community.
5) (G, 35)	At the same time, **we** must ensure that in mobilizing globally, we do not invite the establishment of ideological conformity and a new lock-step "ism."
6) (G, 12)	We are what is wrong, and **we** must make it right.
7) (G, 52)	The outer boundary of what we currently believe is feasible is still far short of what **we** actually must do.
8) (G, 51)	These are the last few years of decision, but they can be the first years of a bright and hopeful future if we do what **we** must.